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The objective of our research program was to develop a research infrastructure for studies defining molecular markers and their interaction with other factors as risk indicators for development of breast cancer among women with benign breast disease (BBD). We estimated the incidence of breast cancer development in African American and Caucasian women with biopsy-proven BBD and collected and archived in a specimen bank samples of benign breast disease lesions and breast cancer from women in this cohort. We also developed a culturally sensitive questionnaire for collecting breast cancer risk factor information. We constructed a cohort of women with BBD between 1981-1994 who were followed from 5-15 years and yielded 218 women who developed invasive breast cancer. This work built the foundation, in terms of a cohort, a specimen bank and a survey instrument for the conduct of molecular epidemiologic studies of breast cancer in a multi-ethnic population.

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Christine Cole Johnson 02/14/01

PI - Signature Date

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INTRODUCTION

The Specific Aims remained the same throughout the proposal, which relate to laying part of the foundation for our long-term research objective. Our long-term goals were to define DNA markers and their interaction with other epidemiological characteristics in order to better describe risk indicators for the subsequent development of breast cancer. This work is being conducted among a cohort of women with benign breast disease (BBD), consisting of Caucasians and African Americans. We requested and obtained a no cost extension of our funds to complete the project in the fall of 2000. Our specific aims for this developmental work were:

1. to estimate the incidence and time span of breast cancer development in a large cohort of African American and Caucasian women with biopsy-proven BBD;

2. to collect and archive in a specimen bank samples of benign breast disease lesions and breast cancer from women in this cohort;

3. to develop and test a questionnaire for collecting breast cancer risk factor information that will:
   a) allow the construction of an exposure index for lifetime exposure to sex hormones; and
   b) designed to be sensitive to the perceptions of African American as well as Caucasian women.

This work has successfully provided the infrastructure for a research program using the established cohort, biorepository and data collection instruments to provide further molecular discriminators of risk in addition to other correlates such as histologic parameters, estrogen and progesterone exposure, reproductive history, family history of breast cancer, and various demographic characteristics. The important clinical and public health implications of this study include the potential to: 1) identify women with high risk lesions and/or personal

characteristics who then can be targeted for follow up; 2) identify and reassure a larger population of women having lesions with no increased risk; and 3) correlate DNA markers, DNA ploidy and histology with hormonal and familial risk factors. In addition, this work has fueled a number of ancillary studies, which will be described below.

BODY

Women with benign breast lesions, particularly those with lesions classified as proliferative and especially as atypical hyperplasia, are at increased risk for subsequent development of breast cancer. The goal of the research program we have developed is to characterize selected DNA markers and their interaction with other epidemiologic risk factors, particularly exposure to estrogen, that can serve as risk indicators for subsequent development of breast cancer among two groups of women with benign breast disease (BBD), Caucasians and African Americans. This funding of this application allowed the accomplishment of preliminary work that has laid part of the foundation for our research program and will be generally applicable in the field of breast cancer epidemiology as well.

The information we gained from this work is being used in an NIH funded study to evaluate, within the identified cohort and using a nested case-control design, histopathological, molecular, and personal characteristics, and their interactions as risk factors for the development of breast cancer among African American and Caucasian women with biopsy proven BBD. The developed questionnaire will be useful in general in the conduct of epidemiological studies of breast cancer, especially those that include African American women.

Experimental Methods

1.0 Specific Aim 1: Cohort Establishment and Follow-up

1.1 Cohort Enrollment

Subjects for the cohort were obtained from individuals who underwent breast biopsy at HFHS in Detroit, MI from 1981-1994. Each hard copy pathology report in the Department of Pathology patient files dated January 1981 through December 1994 was reviewed by a trained research assistant. (Between 28,000 and 66,000 reports are filed a year.) The research assistant completed the identification, pulling and copying of all breast related pathologic reports (n=10,034). A pathologist/co-investigator with expertise in breast pathology, Dr. Usha Raju, completed the screening review of the pathology reports and identified the biopsies with a diagnosis of BBD. All reports were categorized into benign and malignant specimens, for which we developed a tracking form. Women with a concurrent or previous invasive carcinoma in the same or contralateral breast, or found to have a diagnosis of breast cancer within six months of the study biopsy, were set aside as a separate group. They were identified by other pathology reports, the tumor registry, or other means, and were not included in the BBD cohort as they could not be considered wholly "disease free" (at risk) upon entry into the cohort. When multiple biopsies belonging to one individual were encountered, the first biopsy during the study time period was used, and the date of that biopsy was the time of cohort enrollment.

The number of eligible subjects with benign lesions was originally anticipated to be approximately 4815 (Table 1). This estimate was based on review of available material for 1981 and on data from the computerized data base available from 1988-1991. At HFHS, in accordance with departmental policy, all pathology material dating from 1981 has been saved. All cases of benign breast disease identified through these processes were enrolled in the cohort. All individuals enrolled as study subjects were followed for occurrence of breast cancer.

Table 1. BBD Study Estimates, based on follow up through 12-31-96

Year of BBD	No. BBD Samples	No. Excluded	No. Eligible Subjects	Years of Follow-up	Rate Applied per 100,000 Dx at HFH†	PY Follow-Up	Exp No. HFH Br. C	Total Cases ‡
1981	168	19	149	15	336	2235.24	7.5	10
1982	242	27	215	14	336	3005.16	10.1	13
1983	268	30	238	13	336	3090.31	10.4	14
1984	186	21	165	12	336	1979.78	6.7	9
1985	298	34	264	11	336	2907.59	9.8	13
1986	378	43	335	10	336	3352.86	11.3	15
1987	600*	68	532	9	551	4789.80	26.4	35
1988	821	93	728	8	551	5825.82	32.1	43
1989	740	84	656	7	551	4594.66	25.3	34
1990	840	95	745	6	551	4470.48	24.6	33
1991	887	100	787	5	551	3933.85	21.7	29
	5428	613	4815			40186	186	248

† Actual 1981 rate used for 1981-1986; actual average annual rates from 1988-93 used for 1987-1991.
‡ Based on the 1981 pilot cohort showing a third of cases of breast cancer diagnosed outside HFHS.
* Estimate, other years actual.

Table 2 below presents the actual number of subjects in the cohort by year and the number of cases ascertained. From 1981-1994, index biopsy reports from 5268 women were identified as benign and potentially eligible; 5146 were actually eligible. We completed follow-up attempts on all cohort members. Of those 3900 contacted, 3715 (95.3%) provided information and 185 (4.7%) refused to participate.

Data bases were developed that include study ID, medical record number, pathology specimen number, and tracking form results, as well as information from other data sources (pathology classification, follow-up information, risk factor questionnaire, tumor registry).

Aim 1 of our study was to calculate the incidence of breast cancer in our cohort, stratifying by characteristics of our BBD subjects and the baseline pathology classifications. We found 218 breast cancer cases. We calculated updated crude incidence rates by year of BBD in the table below. An abstract with incidence data from this study was presented at the American Association for Cancer Research meetings in April 1999 and 2000, and the

Department of Defense Breast Cancer meeting in Atlanta in June 2000.

Table 2. Calculation of crude incidence rates for breast cancer in the BBD study cohort

Year	No. eligible in BBD Cohort	Person-years of follow-up	No. breast cancer cases	Incidence rate/yr/100000
1981	222	3850	16	416
1982	257	4270	16	375
1983	259	4040	15	371
1984	229	3370	12	356
1985	340	4670	13	278
1986	435	5460	28	513
1987	492	5740	29	505
1988	422	4570	16	350
1989	417	4090	20	489
1990	372	3310	8	241
1991	358	2810	14	498
1992	447	3100	8	258
1993	383	2270	11	485
1994	513	2530	12	474
Total	5146	54070	218	403

For each potential benign breast specimen, a pathologist microscopically reviewed all corresponding pathology slides and diagnostically recorded all lesions on a detailed Pathology Review Form (PRF) (see Appendix B). An intra-rater reliability study was incorporated into the pathology review, whereby a 10% sample from each cohort year was selected by the programmer for blinded rereview by the primary pathologist. Based on 23 re-reviews, results indicated reliability to be well over 90%. Cases diagnosed with atypical hyperplasia were also reviewed by secondary pathologists for inter-rater reliability (50 cases were completed).

1.2 Cohort Follow-up

The initial source for follow-up information was the Henry Ford Health System (HFHS) tumor registry. Many of the subjects who develop breast cancer, who continue to reside in metropolitan Detroit, returned to HFHS for diagnosis and treatment. Information stored in the HFHS tumor registry includes demographics, in addition to occupation, family history of cancer, and a summary of concurrent and underlying medical conditions.

Secondly, we located and traced each woman to interview her by telephone and inquire about breast cancer status (see form in Appendix B). A trained interviewer followed up and contacted cohort members to ascertain the occurrence of breast cancer and the willingness of cohort members to participate in a telephone interview at some later point in time.

We found that considerable information useful for locating study subjects is automated in our electronic medical record system, so we utilized that source initially to conduct follow-up. All women entered into the study and the next of kin of those known to be deceased, were contacted through letter and follow-up phone call requesting information on cancer history and for a locator form for future contacts. Introductory letters were mailed for all years 1981- 1994 (n=5268). The names of those women remaining lost to follow-up after substantial tracing efforts were linked with the statewide cancer and mortality registries. We also linked names with an internet-based tracing database that was developed for another study.

Subjects or their next of kin who had a breast cancer diagnosed at a facility not affiliated with HFHS were asked to sign a release document that gave us permission to obtain and review their hospital records to obtain specific information on the reported cancer and obtain pathological material.

2.0 Specific Aim 2: Identification and Archival of Breast Tissue Specimens

We established a breast tissue biorepository for the pathological material collected from archived samples in this study. Dr. Worsham is overseeing the breast tissue biorepository. The pathology archives were searched by the laboratory research assistant to retrieve slides and respective paraffin-embedded tissue blocks. When only blocks remained, the blocks were cut and new slides prepared for storage.

We recognize that this biorepository will serve as an important resource for molecular studies of future relevant biomarkers. We have been able to appreciate with even greater clarity the limitations that are inherent with DNA amounts from small foci such as hyperplasia, atypical ductal hyperplasia and other preneoplastic lesions of small foci.

Finally, the HFHS Josephine Ford Cancer Center made substantial progress in the development of an organized system biorepository that serves as a cultured cell bank and a DNA bank not only for breast cancer but other cancers as well. A grant requesting partial support for this tissue repository was submitted to NCI in November 1999 in response to an RFA, received a fundable score, and we have just learned will be funded in 2001.

3.0 Specific Aim 3: Development of a Risk Factor Questionnaire

3.1 Development of Sex Hormone Exposure Index

Numerous breast cancer risk factor studies have been conducted examining various characteristics that are surrogate measures of exposure to estrogen. We have developed a questionnaire, using a calendar approach as a memory prompt, to inquire extensively about factors that are associated with sex hormone exposure.

In the process of finalizing our variables to be collected, we consulted with two physicians specializing in reproductive endocrinology, Ronald Strickler and Max Wisgerhof. Using our questionnaire, we hope investigators will be able to assess cumulative hormonal exposure at various points of time in a woman's life including adolescence in order to examine whether cumulative exposure relative to age is important. There is reason to believe that the breast is most susceptible to carcinogenic influences at younger ages; DNA synthesis is higher in young individuals, and women under age 20 were at highest risk for radiation-induced breast cancer after atomic bomb exposure.

3.11 Variables On the Questionnaire

We included on the data collection instrument questions about age at menarche, lifetime menstrual cycle pattern, menopausal history, dates and duration of pregnancies, duration of lactation, infertility, history of use of oral contraceptives, fertility drugs, estrogen replacement therapy, and height and weight history (see Appendix B for final version of questionnaire).

3.12 Development of Exposure Indices

Since we will not have actual hormone exposure data for individuals in potential retrospective studies (i.e. blood levels over time), exposure assessment in future studies will focus on the surrogate measures for estrogen and progesterone exposure as listed in the survey instrument and calendar. Importantly, we placed an emphasis on collecting the data in a manner that allows the assessment of changes over a woman's lifetime. An investigator could assign estimated quantitative hormone exposure scores for different reproductive characteristics during various segments of a woman's life (for example, none/low, medium, and high categories) by relying on data in the literature and on the expert advice.

3.2 Design of a Risk Factor Questionnaire Sensitive to a Multi-Ethnic Population

Focus groups, which allow for group interaction and greater insight into the meaning of certain questions in specific populations, may be used to plan and design questionnaire items or to evaluate existing ones. Discussions during focus groups are a qualitative approach to learning about psychological and sociocultural characteristics and processes in subgroups of the general population. Focus groups are typically composed of 7 to 10 participants who are usually homogenous in such characteristics as age, gender, race/ethnicity, and social characteristics.

In the summer of 1998, we held two focus groups for two purposes: to develop questions that are culturally tailored to African American women in the two age groups, and to examine the perceptions of the women toward components of existing questionnaires assessing estrogen exposure and other breast cancer risk factors. These perceptions were used to adapt our draft to make them better suited for use among African American women. The women's opinions regarding the cultural sensitivity and feasibility of existing questionnaire items related to estrogen risk factors was solicited. The first focus group (n=12) was held with African American women aged 18-50 years who were randomly selected from the Henry Ford Health System (HFHS) patient population and invited to participate in a two-hour focus group, while the second focus group (n=9) was held with African American women aged 50+ years who were recruited in a similar manner.

A sample set of focus group questions referring to a specific table in the breast cancer risk factor survey include: (a) Are the instructions on how to fill out the table clear to you?; (b) If not, how could they be made clearer?; (c) How would you feel if you were asked to complete this table?; (c) Are the words in the table clear to you?; (d) If not, which words would you use to describe these things?; and (e) How does the layout of the table look to you? The results of the focus group revealed several categories related to the survey design. These categories include the overall content of the survey, survey questions requiring calculations or detailed remembrances of past events, privacy and confidentiality issues, and the overall experience of completing the survey.

Each two-hour focus group was audio-taped and videotaped. Based on the comments the women generated during the focus group meetings, the questionnaires were revised. We include transcripts from these focus groups (see Appendix A), and presented information about this work at the 1999 AACR meeting, the March 1999 workshop entitled the Multicultural Aspects of Breast Cancer Etiology and the 2000 Dept of Defense Breast Cancer meeting (abstracts in Appendix C). A manuscript is currently under review (see Appendix C for

copy). A summary report of the focus groups is included in Appendix A.

3.3 Testing of RFQ

We piloted our penultimate version of the instrument (the Women's Health Study Risk Factor Questionnaire) on both African American and Caucasian women, as well as women who vary by age and socioeconomic status. The purpose of pilot testing the RFQ was to evaluate the survey's content, layout, detail and readability. Female friends, family members and co-workers were asked to voluntarily complete the questionnaire through either self- or telephone interviewer administration. Thirty subjects received a questionnaire packet, through the U.S. mail or hand delivery, containing the survey, a Data Form to record demographic information, a Life Events Calendar to document important life events as an aid to survey completion, Continuation Pages for the Pregnancy and Family History sections, a Body Picture diagram to assess body image, and an Evaluation Form for the subject to write their impression of the questionnaire. Seven surveys were self-administered while ten were completed with the assistance of a telephone interviewer.

Comments on the materials, recorded on either the form itself or the evaluation form, were compiled. Based on the feedback from the women, the survey was considered clearly written and easy to understand; the layout was noted as good but a few found it lengthy or somewhat complex; the level of detail and ability to recall was mostly considered difficult but most subjects were able to complete the survey in its entirety; and the survey package, in its entirety, was thought to be good and helpful. The questionnaire took approximately one hour to complete. Detailed data on these pilot results are included in Appendix A.

Comments and suggestions specific to certain sections were assessed and alterations made: consolidation of questions under the Pregnancy section, simplification of the Menstruation and Menopausal History section,

reconstruction of the Household and Exercise Physical Activity sections, and inclusion of half-sibling data in the Family History Section. Other changes from the investigator's discernment included simplification of the wording, text spacing, section title revisions, and additional answer choices and skip pattern directions. Based on this pilot study and cost concerns, for a full scale implementation we would recommend, if possible, that the survey be given face-to-face since it is daunting for subjects to complete on their own. The final version is included in Appendix B.

4.0 Spin-off benefits of the DoD funding

As a spin-off to this work, we linked all the breast cancer cases in the HFHS tumor registry with the Detroit SEER registry to obtain survival data. We analyzed these data with a focus on explaining the difference in survival between a subset of African American (AA) and European American (EA) women belong to our system HMO. Screening, diagnosis, treatment and follow-up patterns for this population are based on standard practices within the medical group, with mammography as a covered benefit. We abstracted data on cases of breast cancer diagnosed between 1986-1996 (N=886) and followed these cases for survival through April 1997 (N=137 deaths). Many studies have shown that AA women with breast cancer have poorer survival than EA women. After adjustments for socioeconomic variables, survival differences between blacks and whites are generally diminished, but remain, and may be due to residual differences in access to health care or biologic or behavioral differences. In our study, AA women were diagnosed at a later stage when compared with EA women. Five-year survival was 77% for AAs and 84% for EAs. Using a Cox regression model, the crude hazard for AAs relative to EAs was 1.6 (95% confidence interval (CI) 1,1, 2.2). Adjusting only for stage of disease at diagnosis, the hazard ratio was 1.3 (95% CI 0.9, 1.9). Adjusting only for sociodemographics (age, marital status and income), the hazard ratio was 1.2 (95% CI 0.8, 1.9). After adjusting for age, income, marital status and stage, the hazard ratio was 1.0 (95% CI 0.7, 1.5). Thus, adjustments taking into consideration

differences in stage, sociodemographic and tumor-specific prognostic factors eliminated the effect of race on survival among AA and EA women with breast cancer. In Appendix C is a paper describing these results which were published in the *Journal of the National Cancer Institute* in late 1999. We also examined treatment differences between these groups and found no material differences (published in the Annals of Surgery in 1999).

A second ancillary study involves this same group of women. The research assistant who has been working on this project, together with some students working with us, obtained the medical records of the women in the breast cancer survival study to abstract information regarding the use of screening mammography, in an attempt to explain the difference between stage at diagnosis. When adjusting for mammography, we still found a stage difference by race among younger women, with African Americans having a higher stage at diagnosis. These results were presented at the AACR 2000 meeting (Appendix C). A manuscript is under preparation.

These studies used several processes that will be useful in future breast cancer research. This study demonstrated that our administrative billing data can be used effectively to update the HFMG tumor registry. It served to refine statistical methods that will be employed in later data analyses. For example, we considered the possibility that our method of updating the tumor registry's "date last known alive" with visit data would bias our estimates of survival, if one ethnic group were more likely to have contact with our physicians following diagnosis. Therefore, we conducted the analysis twice: first, only tumor registry follow-up dates were included; second, we used the updated data. Only negligible differences between the two approaches were found, justifying analyses with the updated data.

The investigators/consultants/staff on this proposal have reported results related to breast cancer in 6 manuscripts and 20 abstracts at national meetings, as detailed below. The project has also served as a valuable training experience for students and postdoctoral graduates. Finally, Drs. Johnson and Worsham have met twice with a newly established international consortium of investigators working on studies using BBD archived tissue, organized by Dr. Tom Rohan, formerly of the University of Toronto and now at Einstein in New York City. This group includes investigators with BBD cohorts from the University of Toronto, the University of North Carolina at Chapel Hill, Mayo Clinic, the University of Washington/Group Health Cooperative, and the ICRF group in London, UK, as well as ourselves. The group is developing a grant proposal to conduct laboratory and statistical analyses using the combined cohorts to ascertain risk factors for breast cancer, with an initial focus on p53 mutations.

5.0 Key Research Accomplishments

- Established a multi-ethnic cohort of 5146 women with BBD who have been followed up for occurrence of breast cancer
- Developed a culturally acceptable questionnaire to be used for epidemiological studies of breast cancer
- Calculated an average annual incidence of breast cancer of 403.0 per 100,000 women with BBD.
- Measured 5-year survival rates in African American versus Caucasian women diagnosed with breast cancer and found a difference in crude survival rate of 77% vs 84% respectively. Upon adjustment for age, stage of disease at diagnosis, and markers of SES, this difference disappeared.
- Found upon further investigation that a major difference in this group of women was that the African American women under 50 had a later stage of breast cancer at diagnosis, even after adjustment for differing rates of mammography utilization.
- Established an international scientific consortium to combine cohorts of women with BBD.

6.0 Reportable Outcomes

Manuscripts

Ford ME, Hill DD, Morrison J, **Worsham M**, Havstad SL, **Johnson CC**. Developing a culturally appropriate breast cancer risk factor survey for African American women. Revision submitted to *Oncology Nursing Forum*, Jan 2001.

Worsham MJ, Nathanson DN, Strunk M, **Christopherson P, Wolman SR**, Pals G. New BRCA1 Mutation in a Filipino Woman with a Familial History of Breast/ovarian Cancer. *Diag Mol Path*, in press.

Ulcickas Yood M, Johnson CC, Blount A, Abrams J, Wolman E, McCarthy BD, **Raju U, Nathanson DS, Worsham M, Wolman SR**. Lack of racial differences in breast cancer survival in a managed care population. *J Natl Cancer Inst* 1999, 91 (17):1487-1491.

Ulcickas Yood M, McCarthy BD, Lee NC, Jacobsen G, **Johnson CC**. Patterns and characteristics of repeat mammography among women 50 years and older. *Cancer Epidemiology, Biomarkers Prevention* 1999 8:595-599.

Pals G, Pindolia K, **Worsham MJ**. Rapid and sensitive approach to mutation detection in *BRCA1* using real time PCR and melting curve analyses. *Molecular Diagnosis* 1999 4:241-246.

Chapman J-AW, **Wolman E, Wolman SR**, Remvikos Y, Shackney S, Axelrod DE, Baisch H, Christensen IB, White RA, Liebovitch LS, Moore DH, Waldman FM, Cornelisse C, Shankey TV: Assessing Genetic markers of tumor progression in the context of intra-tumor heterogeneity. *Cytometry* 1998 31; 67-73.

Abstracts in 1999 and 2000

Johnson CC, Blount AC, Raju U, Abrams J, Jankowski M, **Nathanson SD, Wolman SR, Worsham MJ**. Breast cancer incidence among a cohort of women with benign breast disease. Dept of Defense Research Program Meeting, June 2000.

Ford ME, Hill D, Morrison J, **Worsham MJ, Wolman S, Johnson CC**. Developing a culturally appropriate breast cancer risk factor survey for African American women: focus group results. Dept of Defense Research Program Meeting, June 2000.

Ulcickas Yood ME, Johnson CC, Blount AC, **Abrams J, Wolman E, McCarthy BD, Raju U, Nathanson SD, Worsham MJ, Wolman SR**. Race and breast cancer survival. Dept of Defense Research Program Meeting, June 2000.

Johnson CC, Bawle U, Ulcickas Yood ME. Ethnicity, stage of detection of breast cancer and screening mammography in a health maintenance organization. American Association for Cancer Research, 2000.

Blount AC, Raju U, Abrams J, Jankowski M, Nathanson SD, Wolman SR, Worsham MJ, Johnson CC. Breast cancer incidence among a cohort of women with benign breast disease. American Association for Cancer Research, 2000.

Ford M, Hill D, Morrison J, **Worsham MJ, Wolman S, Johnson CC.** A culturally appropriate breast cancer risk factor survey for African American women: focus group results. American Association for Cancer Research, 2000.

Johnson CC, Bawle U, Ulcickas Yood ME. Ethnicity, stage of detection of breast cancer and screening mammography in a health maintenance organization. HMO Research Network, 2000.

Ford ME, Hill D, Johnson CC, Wolman SR, Worsham MJ. Using Focus Groups in Breast Cancer Research. Multicultural Aspects of Breast Cancer Etiology, Washington DC, March 17-19, 1999, awarded Travel Award.

Ali R, Wiesner G, Kaisi N, Badin R, Pals G, **Worsham MJ.** Arabic women and breast cancer: loss of heterozygosity and microsatellite instability of the BRCA1 locus. Workshop on Multicultural Aspects of Breast Cancer Etiology, Washington DC, March 17-19, 1999, awarded Travel Award.

Ford ME, Worsham MJ, Johnson CC. Developing a culturally appropriate breast cancer risk factor survey for African American women. American Association for Cancer Research, April, 1999

Johnson CC, Blount AC, Raju U, Abrams J, Wolman SR, Worsham MJ. Incidence rates for breast cancer among women with benign breast disease. American Association for Cancer Research, 1999.

Johnson CC, Ulcickas Yood M, Blount A, Abrams J, Wolman E, McCarthy B, Raju U, Nathanson D, Worsham M, Wolman S. Lack of racial differences in breast cancer survival in a managed care population. HMO Research Network, March 1999.

Worsham MJ, Wolman SR, Raju U, Barnabas N, Nathanson DN, Pals G: evaluation of the *atm* locus as a contributing factor in development/progression of *brca1* germline-mutated tumors. Association for Molecular Pathology, San Diego

Worsham MJ, Wolman SR, Raju U, Barnabas N, Nathanson DN, Pals G, **Zarbo RJ**: Evaluation of *BRCA1* antibodies as a screening tool for germline *BRCA1* mutations. Association for Molecular Pathology, San Diego

Ali R, Wiesner G, Kaisi N, Badin R, Pals G, **Worsham MJ.** Loss of heterozygosity (LOH) and microsatellite instability (MSI) of the BRCA1 locus in Arabic women with breast cancer: 4th Annual Multidisciplinary Symposium on Breast Disease, Amelia Island February 11-14, 1999

Pals G, K. Pindolia K, **Worsham MJ.** Mutation detection in BRCA1 using real time PCR and melting curve analyses. 49th American Society Human Genetics Meeting, San Francisco, October 19-23, 1999

Pals G, Young C, Mao H, Pindolia K, **Worsham MJ.** Single cell mutation detection in *BRCA1* utilizing real time PCR and melting curve analyses. Association of Molecular Pathology, Nov. 1999.

Worsham MJ, Ali R, Pals G: Ethnic differences in breast cancer susceptibility. Second Asian Conference in Breast Cancer, Tianjin, China, September 1-2, 1999.

Worsham MJ, Johnson CC, Raju U, Abrams J, Blount A, Wolman SR. Benign breast disease (BBD) and risk of breast cancer (BC): Incidence rates for BC and intra observer reliability in classifying BBD Lesions. Second World Breast Cancer Conference, Ottawa, Canada, July 25-30, 1999, 49th American Society Human Genetics Meeting, San Francisco, October 19-23, 1999.

Worsham MJ, Macoviak P, Patel N, **Zarbo RJ**. Status of the Her2/neu gene testing in breast cancer: FISH versus IHC: A study of 165 patients. Association of Molecular Pathology, Nov. 1999

Products

- Established a tissue biorepository, linked by a database with epidemiologic information, of archived benign breast disease tissue specimens.

Career Development

Grants and other Funding

- Applied for and obtained core grant funding from NCI for a tissue repository for breast and other major cancers at HFHS.
- Applied for and obtained NCI funding for research to conduct molecular studies related to the BBD cohort established through this proposal (R01 CA70923 Benign Breast Disease: Molecular Differentiation of Risk; PI Maria Worsham).
- Applying for grant to combine BBD cohorts to study p53 mutations and breast cancer as an outcome (PI T Rohan).

Trainees on the project

- Ulke Bawle, masters student, University of Michigan, June 1997-May 1999, doctoral student, Columbia, Sept 1999- present.
- Robert Coates, University of Michigan School of Public Health, Wayne State University Medical School, masters and medical student June 1998 through the present
- Deanna Hill, doctoral student, University of Pittsburgh (current)

- Azadeh Stark, University of North Carolina post doctoral student in cancer epidemiology.
- Marianne Ulcickas-Yood, Boston University, doctoral student, fall 1997 through June 1998.

Conclusions

As was reported last year, progress was slower than planned, due to the fact that the hard copy pathology report review (now complete) and the pathology classification (now complete) took longer than anticipated, which backed up all study processes. Therefore, we did not use as much interviewing and follow-up time early on, resulting in our requests for no cost extensions. We completed our follow-up and case ascertainment in the past year of the no cost extension.

Our results yielded a well-documented cohort, biorepository, and database from which to generate study ideas. We also have a risk factor questionnaire to be used in studies evaluating reproductive and medication related variables in multicultural women's health studies, especially epidemiologic studies of breast cancer. The cohort and BBD biorepository is being used in a currently funded NCI study—R01 CA70923 Benign Breast Disease: Molecular Differentiation of Risk; PI Maria Worsham, who is a coinvestigator on this Department of Defense proposal. This project is designed to investigate the interplay of lifestyle and personal characteristics with selected molecular markers and risk for breast cancer among with BBD. The developed questionnaire is also being utilized. Another epidemiologist who has been involved in the project, Dr. Azadeh Stark, is submitting a proposal to ACS this March with Dr. Raju, the pathologist on this proposal. They plan to study the clinical outcomes of the women identified with CIS in the process of identifying the BBD cohort through this Department of Defense proposal. Finally, we have become charter members of an international consortium committed to combining expertise and data from cohorts of women with benign breast disease to increase and enhance our abilities to address research issues surrounding women with this condition.

Appendices

A. Focus Group Reports and Pilot Study Results

B. Forms: Risk Factor Questionnaire & Medical Record Abstract

C. Selected Abstracts and Manuscripts

APPENDIX A.

Focus Group Reports

Pilot Study Results

Developing A Culturally Appropriate Breast Cancer Risk Factor Survey for African American Women

Ford, ME, Hill DD, Worsham MJ, and Johnson CC.
Henry Ford Health System
Josephine Ford Cancer Center and
Resource Center for African American Aging Research

ABSTRACT

The purpose of this study was to develop a culturally appropriate breast cancer risk factor survey. Guided focus groups were conducted using items compiled from standardized surveys on breast cancer risk factors. The first focus group (n=12) was held with African American women aged 18-50 years randomly selected from the Henry Ford Health System patient population. A second focus group was held with nine randomly selected African American women aged 50+ years. Each two-hour focus group was videotaped. The women in the younger age group stated that the rationale for the item on race/ethnicity was not clear, the relevance between parent□s country of origin and breast cancer risk was not clear, and that it was difficult to remember the number of menstrual periods they had had in previous decades. In the younger age group, breast cancer risk factors cited included heredity, smoking, underwire brassieres, chemical exposure, breast density, weight, drug use, and lack of estrogen exposure. The women in the older age group stated that in the past, their doctors did not name their medications or describe the full extent of their medical conditions. The meaning of several terms, such as demographics, was not clear, and family medical history was often unknown. In the older age group, breast cancer risk factors cited included heredity, hormone replacement therapy, diet, lack of breast self-exams and mammography, and estrogen exposure. Women in both age groups stated that it was difficult to recall previous average weight, alcohol consumption, and level of physical activity, and that the sports listed were not culturally appropriate. The results show that questionnaire items developed in the general population may not be appropriate for African American women, and that education about breast cancer risk factors is needed for this population.

RATIONALE FOR ASSESSING THE BREAST CANCER RISK FACTOR SURVEY FOR ITS LEVEL OF CULTURAL APPROPRIATENESS

- Practice guidelines and public policies are based upon research using existing measurement instruments to assess physical health and mental health outcomes.
- However, age and racial/ethnic group differences may exist in the structure and measurement of these outcomes.{1226,1227,1231,1202,1207,1224,1210,1216}
- Each racial/ethnic group has its own set of cultural characteristics.
- The factor structures of health measures may differ across age and racial/ethnic groups.
- Instruments tested in one population with high reliabilities may show low reliability when tested in another population.
- Within specific age and racial/ethnic groups, there is a need to examine the reliability and validity of measurement instruments, including those "validated" in the general population.
- Even instruments used as "gold standards" may still need to be assessed for specific population groups.
- It Is Important:

    1. Not to assume that the meaning of terms is the same across age and racial/ethnic groups.
    2. To understand the cultural context in which responses to questionnaire items are made. Understanding the cultural context can aid in the interpretation of data.

RATIONALE FOR CONDUCTING FOCUS GROUPS

- Culturally appropriate measurement instruments can be developed through the use of focus groups.
- Focus group research can be a rich source of information.
- Data are collected from a homogeneous group of individuals using a predetermined, structured sequence of questions in a focused discussion (Krueger 1988).
- Qualitative as well as quantitative data may be acquired (Kohler et al. 1993).
- An advantage of incorporating both qualitative and quantitative components in the focus group sessions is the ability to analyze the degree of congruence between the two types of evaluation (Kohler et al. 1993).

- Focus Groups:

1. Can be conducted with individuals representative of the population(s) that will complete the survey.
2. Can help develop/modify questions that have meaning for each population.
3. Allow for an in-depth exploration of the knowledge, attitudes and beliefs of specific cultural groups. It is difficult to obtain as wide an array of information from a survey.

GOALS OF THE PRESENT STUDY

- In the present study, focus groups were used for two purposes:
  1. To elicit feedback from two age-specific groups of African American women regarding an existing breast cancer risk factor survey.
  2. To obtain detailed information about the perception of breast cancer risk factors among the two groups of women aged 18-50 years and 50+ years.

METHODS

- A 20-page moderator's guide based on the existing breast cancer risk factor survey was developed.
- The Henry Ford Health System (HFHS) Corporate Data Store was used to randomly identify patients meeting the following criteria:
    1. African American
    2. Women
    3. Aged 18-50 years (focus group one) and aged 50+ years (focus group two)
    4. Visit made to HFHS in the last six months

- From this listing of potential participants, women were randomly selected to be called by telephone and invited to participate in a focus group.
- A short eligibility screener was conducted during the invitational call. In addition, the $40 honorarium was described.
- Eligible and interested women were sent a written confirmation of their focus group date, time, and location. (Transportation to the focus groups was not provided.)
- The women received a reminder call the night before their scheduled focus group session.

METHODS (cont'd)

- In conducting the focus groups, the following procedures were used:
  1. During each focus group, the moderator, assistant, and recorder were African American women under 40 years of age.
  2. The two-hour focus groups were videotaped and audiotaped.
  3. Prior to each focus group, participants signed a consent form and received a packet containing a nameplate (for identification of participants to the moderator), a copy of the survey to be evaluated, and a body image pictograph.
  4. The purpose of the focus group was explained, and participants were encouraged to freely voice their opinions.
  5. Confidentiality ground rules were laid.
  6. The focus groups began with a icebreaker.
  7. Then, the moderator began asking questions. A sample set of questions referring to a specific table in the breast cancer risk factor survey include:
     (a) Are the instructions on how to fill out the table clear to you?
     (b) If not, how could they be made clearer?
     (c) How would you feel if you were asked to complete this table?
     (d) Are the words in the table clear to you?
     (e) If not, which words would you use to describe these things?
     (f) How does the layout of the table look to you?
  8. Following the focus groups, participants signed a receipt and were given a $40 honorarium.

PRELIMINARY RESULTS

In the younger age group, participants stated that:

- The rationale for the item on race/ethnicity was not clear.
- The relevance between parent's county of origin and breast cancer risk was not clear.
- It was difficult to remember the number of menstrual periods they had had in previous decades.

In the older age group, participants stated that:

- In the past, their doctors did not name their medications.
- In the past, their doctors did not describe to them the full extent of their medical conditions.
- The meaning of several terms, such as "demographics", was not clear.
- Family medical history was often unknown.

PRELIMINARY RESULTS (cont'd)

Table 1
Comments Based on the Breast Cancer Risk Factor Survey

Younger Age Group (n=12)	Older Age Group (n=9)
• Rationale for race/ethnicity item was not clear. • Relevance of parent's country of origin was not clear. • Difficult to remember details about past menstrual periods.	• In the past, doctors did not name their medications. • In the past, doctors did not describe their medical conditions. • Meaning of several terms was not clear • Family medical history was often unknown.

Breast cancer risk factors cited by women in the younger age group included:

- Heredity
- Smoking
- Wearing underwire brassieres
- Chemical exposure
- Breast density
- Weight
- Drug use
- Lack of estrogen exposure

Breast cancer risk factors cited by women in the older age group included:

- Heredity
- Hormone replacement therapy
- Diet
- Lack of breast self-exams
- Lack of mammography
- Estrogen exposure

Table 2
Breast Cancer Risk Factors Cited by Focus Group Members

Younger Age Group (n=12)	Older Age Group (n=9)
• Heredity • Smoking • Wearing underwire brassieres • Chemical exposure • Breast density • Weight • Drug use • Lack of estrogen exposure	• Heredity • Hormone replacement therapy • Diet • Lack of breast self-exams • Lack of mammography • Estrogen exposure

PRELIMINARY RESULTS (cont'd)

In both age groups, participants stated that it was difficult to recall previous:

- Average weight
- Alcohol consumption
- Level of physical activity

Participants in both age groups also noted that the sports listed (such as tennis) were not culturally appropriate.

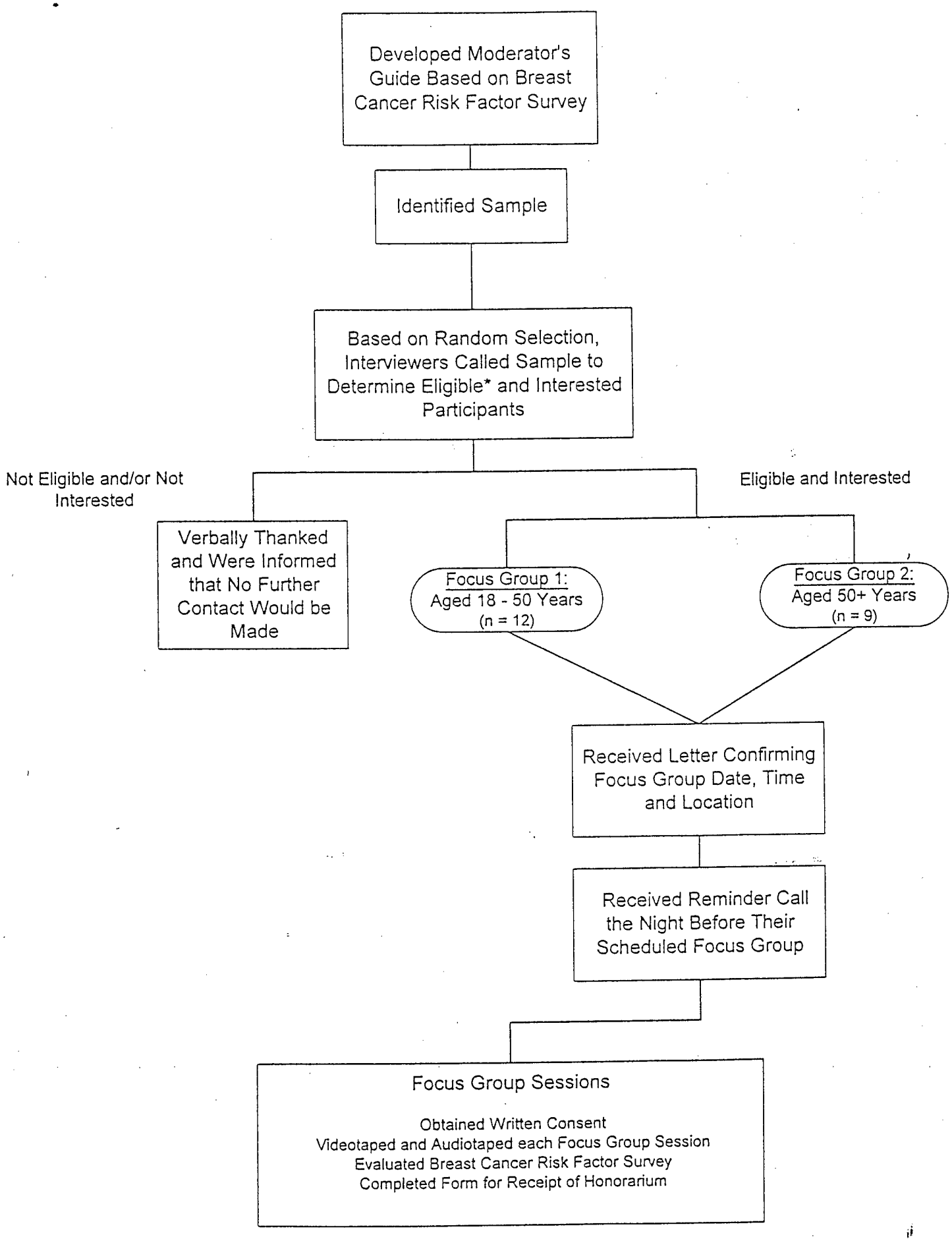
FUTURE DIRECTIONS

Congruent with the approach used by Kohler et al. (1993), the analysis of the data generated by the focus group in conjunction with the knowledge and experience of the study investigators will be used to guide the development of a revised breast cancer risk factor survey.

SUMMARY

Clinical decision-making algorithms and public policies are typically based on the results of research using measurement instruments. These algorithms and policies affect the manner in which health care is provided. Therefore, it is important to assess the cultural appropriateness of measurement instruments for use with specific populations. The results of this research show that breast cancer risk factor questionnaire items developed in the general population may not be appropriate for use with African American women, and that education about breast cancer risk factors is needed for members of this population. In addition, generational differences in response to questionnaire items were seen, indicating that these differences will also need to be taken into account when revising the survey.

Methods Used in the Focus Group Study



*confirmed age, race/ethnicity, and gender

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USING FOCUS GROUPS IN BREAST CANCER RESEARCH

Ford ME, Hill DD, Worsham JM, Johnson CC, Wolman S.
Henry Ford Health System
Resource Center on African American Aging Research and
Josephine Ford Cancer Center

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ABSTRACT

Objective: To describe the results of two age-specific guided focus groups held with African American women to evaluate a breast cancer risk factor survey.

Methodology: A health system patient database was used to identify African American women aged 18-50 years (focus group one) and aged 50+ years (focus group two). From these listings, fifteen women were randomly selected, called and invited to each focus group. Eligible and interested women received a mailed confirmation of their focus group and a reminder call. Each two-hour focus group was videotaped.

Results: The women in the younger age group (n=12) stated that the rationale for the item on race/ethnicity was not clear, the relevance between parent's country of origin and breast cancer risk was not clear, and that it was difficult to remember the number of menstrual periods they had had in previous decades. The women in the older age group (n=9) stated that in the past, their doctors did not name their medications. The meaning of several terms, such as "demographics", was not clear, and family medical history was often unknown. Women in both age groups stated that it was difficult to recall previous average weight, alcohol consumption, level of physical activity, and that the sports listed were not culturally appropriate.

Conclusion: The results show that questionnaire items developed in the general population may not be appropriate for African American women.

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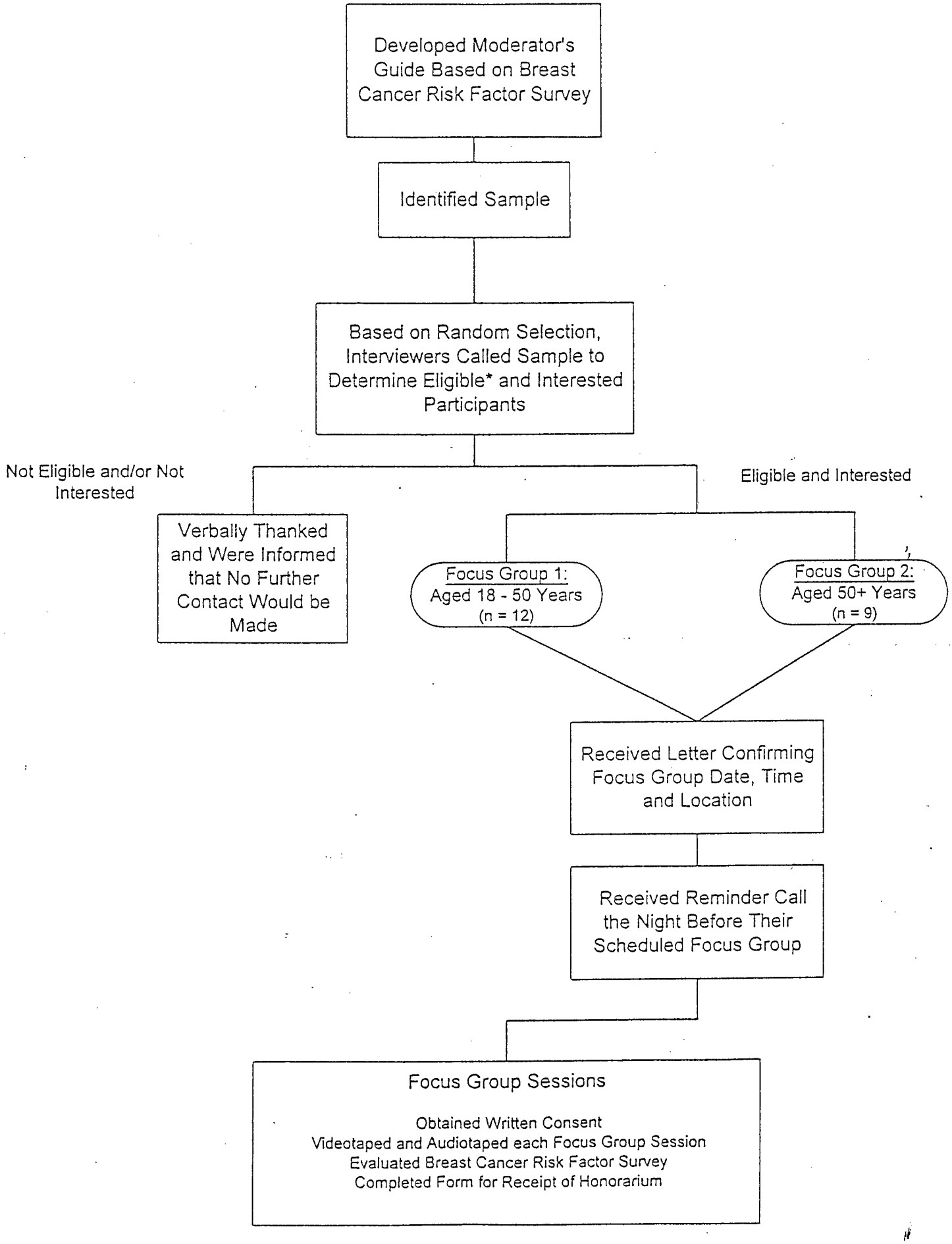

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BENIGN BREAST DISEASE STUDY

Risk Factor Questionnaire Pilot Results

I. Completed Surveys

To conduct the pilot testing of the risk factor questionnaire, female friends, family members and co-workers were asked to complete the survey and corresponding evaluation form to provide feedback to the layout, content, detail and clarity of the survey. Women had the choice of completing the survey through either telephone- or self-administration.

The table below represents the number of women who voluntarily completed the survey through either telephone or self-administration stratified by race and age.

	< 50 White	≥ 50 White	< 50 Black	≥ 50 Black	Total
Phone	3	0	5	2	10
Self	1	4	0	2	7
Total	4	4	5	4	17

II. Evaluation Form Comments

The responses to each evaluation form question are listed below, grouped by similarity and listed from positive to negative expressions. The administration type, age and racial category of the respondent is noted in *( )* after each comment *(P: Phone; S: Self; W: White; B: Black)*. Thirteen women completed the evaluation form.

1. Were the questions in the survey clearly written and easy to understand? Please explain.

Yes *(P: < 50 W; P: < 50 W; P: < 50 B; P: < 50 B; P: ≥ 50 B; S: ≥ 50 W; S: ≥ 50 W).*
Yes, they were very specific *(S: ≥ 50 W).*
Yes, for the most part *(P: < 50 B; P: < 50 W).*

Some of them, I needed help. All in all, it wasn't too bad *(P: ≥ 50 B).*
Fairly easy to understand *(S: ≥ 50 B).*

Some questions were too wordy for example: pages 24 and 26 *(P: < 50 B).*

2. How did you find the format and layout of the questionnaire?

Very good. It moved along at a quick pace *(S: ≥ 50 W)*.
Pretty good. It was helpful for me to have to go over it together *(P: < 50 W)*.

Format and layout are good *(S: ≥ 50 W)*.
Good *(P: < 50 W)*.
Very nice *(P: ≥ 50 B)*.
Fine *(P: < 50 W; S: ≥ 50 W)*.
It was fine *(P: < 50 B)*.
Okay *(P: ≥ 50 B)*.
Clear *(P: < 50 B)*.

Somewhat complex *(P: < 50 B)*.

Very lengthy – lots of repeated information *(S: ≥ 50 B)*.
Again, too wordy, pages 24 and 26 *(P: < 50 B)*.

3. How did you find the questions in terms of the level of detail, ability to recall, etc.?

Good *(P: < 50 B)*.
Very detailed, its simple *(P: ≥ 50 B)*.
It was easier to recall in groups *(P: < 50 W)*.
Not bad *(P: ≥ 50 B)*.

Very detailed questions, my ability to recall past events was just a little difficult *(P: < 50 B)*.

Very difficult *(S: ≥ 50 W)*.
The questions about physical activity are difficult to answer because of difficulty to recall *(S: ≥ 50 W)*.
Very difficult in some areas, such as physical activities and household chores – I'm too old to remember when and how many hours I did these things *(S: ≥ 50 W)*.
Some of it was hard – exercise, alcohol *(P: < 50 W)*.
It was difficult remembering that far back *(P: < 50 B)*.
Difficult to recall weight *(P: < 50 W)*.
Spent a lot of time trying to recall details that happen over 69 years ago *(S: ≥ 50 B)*.
Somewhat difficult trying to recall everything I did at a certain age. Don't think recalling the hours I spent on certain activity necessary *(P: < 50 B)*.

4. *What did you think about the overall survey package including Items A – D (Confidential Locator Form, Life Events Calendar, Continuation Pages and Body Size Picture)?*

Very good *(P: < 50 W)*.
Good *(S: ≥ 50 B; S: ≥ 50 W)*.
Very explanatory and helpful *(P: ≥ 50 B)*.
Helpful *(P: < 50 B)*.
It was somewhat helpful *(P: < 50 B)*.
I think it was fine *(P: < 50 W)*.
Overall, it was fine *(P: ≥ 50 B)*.

The life events calendar is useful to answer the life history survey but it takes easily 90 minutes to complete the package and many could take longer *(S: ≥ 50 W)*.
It took longer than I thought it would *(S: ≥ 50 W)*.

The body size picture should show more of child size figures *(P: < 50 B)*.
Long; body picture didn't seem accurate *(P: < 50 B)*.

5. *Any additional comments?*

Women should make copies for their daughters and grandchildren. May be useful in the future *(S: ≥ 50 W)*.
The booklet was very eye appealing. I like the color coding and the way it was put into a booklet *(S: ≥ 50 W)*.
I hope this survey will be helpful *(P: < 50 B)*.
Sorry I wasn't able to recall all the information requested *(S: ≥ 50 B)*.

Send a reminder call before the interview *(P: < 50 W)*.

Long *(P: < 50 B)*.
Just thought survey was long. Would not have completed it on my own *(P: < 50 B)*.

III. Modifications/Additions (Suggested changes are in *italics*.)

1. Add mail and return date to the survey.

2. Add "circle the number or letter that best matches your response" to the first two pages.

3. Add " → Go To __ " notes next to skip patterns.

4. Remove lines in front of [ ] in a question that refer to a specific category in the column of a table (i.e., AGE) and capitalize bracketed word.

5. Background Information (Page 2, questions 1 – 8): Add separate "Office Use Only" column for coding written data.

6. Medical History (Page 5, question 1): Add more space for subjects to record under Other Medical Problems, Specify category.

5. Pregnancy (Page 6, question 2G): Move breast feeding location question (equally, left or right) as second breast feeding question; and combine questions 2E and 2F to "How old was the child when you started giving him/her formula, milk or food?"

6. Menstrual and Menopausal History (Page 8, question 4A): Delete question because it is asked in question 2.

7. Menstrual and Menopausal History (Page 8, question 4B): Change to "On average, how many days was it from the **first day of one period** to the **first day of your next period** *(a complete menstrual cycle)*?"

8. Menstrual and Menopausal History (Page 10, question 5): Change to "What month and year did you have your **last** period, even if it was *some time* ago?"

9. Other Menstrual Conditions (Page 12, question 1): Add specific outcomes for these conditions: Surgery, Prescription Medication and Other Procedures

10. Contraceptive History (page 14, question 2): Change directions to indicate "[If you answered ***NO to questions 7, 8, 9 and 10*** above, skip the rest of this section and go to the Hormone Medication History section on page 16.]

11. Household Physical Activity (Page 26, question 1): Make example more specific and increase "Time per Day" from 30 minutes to 2 hours and 30 minutes.

12. Farm and Garden History (Page 29, question 1): Change to read "Have you ever *lived or worked* on a farm for more than 6 months?" (Are we after chronic exposure or intermittent summer exposure?)

13. Family History (Page 30, question 1): Change to "Do you know the general medical history of your biologic family?".

14. Family History (Pages 31 – 33, questions 3, 5 and 7): Add "(both full and half)" sisters notation for family history information.

15. Family History (Pages 30 – 35, question 2B): Add "Don't Know" option under relative still living question.

16. Family History (Pages 30 – 35, question 2D): Add more space for subjects to record under Other category.

IV. Questions/Problems to Resolve:

1. Pregnancy History (Page 6, question 2E): What if the mother went from breast feeding straight to regular milk instead of infant formula? Would they answer "Yes" to the child getting at least half of its food from infant formula while still being breast fed? (See Modification #5)

2. Menstrual and Menopausal History (Page 8, question 4): Do we need the phrase "Not during times when you pregnant or nursing, or using birth control pills, shots or implants, or fertility drugs" as part of the regular period question? (It was taken from the CARE survey; it seems confusing to respondents: See Modification #6)

3. Tobacco (Page 22, question 2): How should smoking less than 1 – 2 cigarettes per day (lowest category listed) be recorded, if at all?

4. Family History (Page 31, question 4): How should cancer diagnosed among half sisters be recorded?

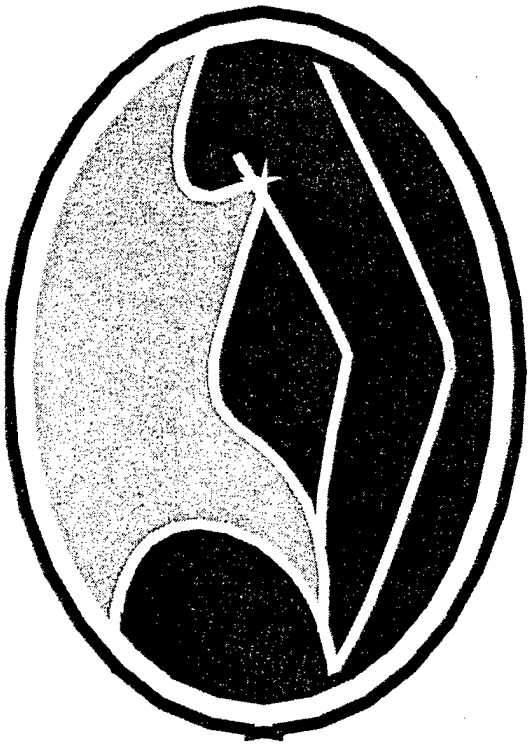
5. Life Events Calendar (Item B): Do we need them to return the calendar or should they keep it for their own record?

APPENDIX B.

FORMS

WOMEN'S HEALTH STUDY

LIFE HISTORY SURVEY



Henry Ford Health System
Department of Biostatistics and Research Epidemiology
One Ford Place, Suite 3E
Detroit, MI 48202-3450

WOMEN'S HEALTH STUDY

LIFE HISTORY SURVEY

FOR OFFICE USE ONLY:	
Study ID:	_ _ _ _ _ _ _ _ _
Survey mail date:	_ _ / _ _ / _ _ _ _
Survey comp. date:	_ _ / _ _ / _ _ _ _
Interviewer ID:	_ _ _
Outcome Code:	_ _ _ _ _

Table of Contents

Instructions

The ***Women's Health Study*** **Life History Survey** will ask you about your medical, lifestyle, work and family history. The survey package contains the following items:

- ✓ Life History Survey
- ✓ Life Events Calendar (Item A)
- ✓ Continuation Pages for Pregnancy and Family History (Item B)
- ✓ Body Size Picture (Item C)
- ✓ Postage-paid return envelope

1. To help you recall the survey responses easier, start by recording important events and dates in your life on the **Life Events Calendar (Item A) before completing the survey.**

2. Once you have filled in the **Life Events Calendar**, begin working on the survey. Record one answer for each question, unless the instructions say differently. For questions listed on the left column, please write or circle the number that goes with your answer in the right-hand column. For questions listed in a table, please check, circle or write your answers in the table. Answer each question to the best of your knowledge. There is no right or wrong answer.

   Please use the **Continuation Pages for Pregnancy and Family History (Item B)** to record additional pregnancy or family history information that could not be listed on the survey. The **Body Size Picture (Item C)** will be used to help you fill in the Body section on pages 18 – 19.

   Because it is important to answer the questions as best as you can remember, you may want to sit down and work on the survey over a few days instead of all at once. It should take you about one hour to complete the survey. If you have any questions about filling out any of the forms, feel free to call Angela Blount at (313) 874-6232.

4. When you have finished the survey and the other forms, please check each page to make sure you have answered all questions that apply to you. Place the ***Women's Health Study*** **Life History Survey,** and **Continuation Pages for Pregnancy and Family History** in the postage-paid return envelope and mail to Henry Ford Health System, Biostatistics and Research Epidemiology, One Ford Place, Suite 3E, Detroit, MI, 48202-3450. If you decide not to complete the survey, please use the envelope to return the materials to us.

All information you provide will be kept confidential and will not affect your medical care. Only the researchers involved in this project will see your answers. Thank you for participating in this important research project to better understand and improve women's health.

Background Information

This section ask some general questions regarding your background. Please record your answer in the spaces provided.

		OFFICE USE ONLY
1. In what state/province and country were you born?	_____ State/Province	[__ __]
	_____ Country	[__ __]

2. **Up to the age of 30**, how many years did you live in each of the following four types of residential area, and the state (if in the United States) or country:

Type of Residential Area	# Years	State/Country	
1. A large city in a metropolitan area (e.g., Detroit, Chicago)	____	_____	[__ __]
2. A suburban city that is part of a metropolitan area (e.g., Southfield, Troy, Livonia)	____	_____	[__ __]
3. A small to medium town distant from a metropolitan area (e.g., Port Huron, Battle Creek)	____	_____	[__ __]
4. A rural area or on a farm	____	_____	[__ __]

The following questions are about your heritage, social setting and culture. This is useful information since some diseases are more common in some ethnic or cultural groups than others. Please write or circle the number that best matches your response to each question.

		OFFICE USE ONLY
3. In which of the following categories would you classify yourself?	1. White/Caucasian 2. Black/African American 3. Hispanic/Latino 4. Asian/Pacific Islander 5. Middle Eastern 6. Native American/American Indian 7. Alaskan Native/Aleut/Eskimo 8. Other group(s), *Please Specify:* _____	[__]
4. Is there an ethnic group or ancestry with which your family household identifies such as Korean, Mexican, Chaldean, Puerto Rican, etc.?	0. No 1. Yes, *Please Specify:* _____	[__]
5. What country are most of your father's ancestors from?	_____	[__]
6. What country are most of your mother's ancestors from?	_____	[__]
7. What religion were you raised in as a child?	1. None Christian Denominations: 2. Baptist 3. Catholic 4. Congregationalist 5. Eastern Orthodox 6. Episcopal 7. Jehovah's Witness 8. Lutheran 9. Methodist/AME/CME 10. Mormon/Latter Day Saints 11. Presbyterian 12. Quaker 13. Seventh Day Adventists 14. Unitarian 15. Protestant, Not Specified 16. Christian, Not Specified 17. Jewish 18. Muslim 19. Other, *Please Specify:* _____	[__]

OFFICE USE ONLY

8. What religion have you practiced most of your adult life?

1. None

Christian Denominations:

2. Baptist
3. Catholic
4. Congregationalist
5. Eastern Orthodox
6. Episcopal
7. Jehovah's Witness
8. Lutheran
9. Methodist/AME/CME
10. Mormon/Latter Day Saints
11. Presbyterian
12. Quaker
13. Seventh Day Adventists
14. Unitarian
15. Protestant, Not Specified
16. Christian, Not Specified
17. Jewish
18. Muslim
19. Other, *Please Specify:*

_____ [__ __]

9. What is the highest grade or level of schooling you have completed?

1. Grade school (less than 8 years)
2. Some high school (8 - 11 years)
3. Completed high school or GED
4. Vocational school
5. Some college
6. Completed college
7. Post-graduate school

10. What is your current marital status?

1. Married or Living as married
2. Widowed
3. Divorced
4. Separated
5. Never Married

11. What is your date of birth?

__ __ / __ __ / __ __ __ __
mm dd yyyy

Medical History

1. Has a doctor ever told you had any of the following conditions? Please place a check **in the box** next to each condition you have ever been diagnosed with.

☐ Chicken Pox	☐ Arthritis (Acute)	☐ Kidney Disease
☐ Measles	☐ Arthritis (Chronic)	☐ Immune System Disorder
☐ Mumps	☐ Hyperthyroid Disease	☐ Stroke
☐ Poliomyelitis (Polio)	☐ Hypothyroid Disease	☐ Transient Ischemic Attack (TIA)
☐ Typhoid	☐ Parathyroid Disease	☐ Food Allergies
☐ Shingles Zoster	☐ Pituitary Disease	☐ Drug Allergies
☐ Herpes Simplex	☐ Hypoglycemia	☐ Hay Fever
☐ Pneumonia	☐ Vitamin B1 Deficiency	☐ Other Allergies
☐ Mononucleosis (Mono)	☐ Vitamin B12 Deficiency	☐ Epilepsy/Seizures/Convulsions
☐ Meningitis	☐ Folate Deficiency	☐ Psychiatric Conditions
☐ Encephalitis	☐ Asthma	Specify: _____ [__ __]
☐ Multiple Sclerosis (MS)	☐ Other Respiratory Disease	☐ Any Type of Cancer
☐ Toxoplasmosis	☐ Migraine Headaches	Specify: _____ [__ __]
☐ Tuberculosis (TB)	☐ Clinical Depression	Specify: _____ [__ __]
☐ Heart Disease	☐ Hypertension (High Blood Pressure)	☐ Other Medical Conditions
☐ Diabetes ('Sugar')	☐ Anemia or Other Blood Disorder	Specify: _____ [__ __]
☐ Stomach or Other Digestive Disorder	☐ Liver Disease	Specify: _____ [__ __]

2. Have you ever had medical radiation (x-rays) to diagnose or treat any of the following conditions:

1. Tuberculosis	0. No	1. Yes	9. Don't Know
2. Postpartum mastitis (inflammation of the breast)	0. No	1. Yes	9. Don't Know
3. Other benign (non-cancerous) breast condition	0. No	1. Yes	9. Don't Know
4. Ankylosing spondylitis (type of rheumatoid arthritis)	0. No	1. Yes	9. Don't Know
5. Scoliosis (curved spine)	0. No	1. Yes	9. Don't Know
6. Tinea capitis (ringworm of the scalp)	0. No	1. Yes	9. Don't Know
7. Enlarged thymus	0. No	1. Yes	9. Don't Know
8. Skin hemangioma (benign tumor on the skin)	0. No	1. Yes	9. Don't Know
9. Childhood cancer (e.g., leukemia)	0. No	1. Yes	9. Don't Know
10. Hodgkin's disease	0. No	1. Yes	9. Don't Know

Pregnancy History

This section asks about all pregnancies you have had. This includes live births, stillbirths, miscarriages, abortions, and tubal (in the tubes) and other ectopic (outside the womb) pregnancies. The medical changes your body goes through during pregnancy may effect your health later on.

1. Have you ever been pregnant?

   0. No → **GO TO Page 8**
   1. Yes

   [If NO, skip the rest of this section and go to the <u>Menstrual and Menopausal History</u> section on page 8.]

2. For each pregnancy you have ever had, we would like to ask your age at the time of the pregnancy, outcome and length of the pregnancy in either weeks or months, and your breast feeding patterns. You can use the **Life Events Calendar (Item A)** to help you with this section. [If you have had more than 6 pregnancies, please record those pregnancies on the **Continuation Pages for Pregnancy History (Item B)**.]

	1st Pregnancy	2nd Pregnancy	3rd Pregnancy
How old were you at the start of your [1st/2nd] pregnancy?	____ age in years	____ age in years	____ age in years
In weeks or months, what was the length of that pregnancy?	____ weeks **OR** ____ months	____ weeks **OR** ____ months	____ weeks **OR** ____ months
What was the outcome of that pregnancy? [If **Answer 4 – 8**, skip to next pregnancy.]	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy
Did you breast feed? [*IF **No or Not Applicable**, skip to next pregnancy.]	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*
Did you breast feed using both breasts equally, or more use of the left or right breast?	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know
How old was the child when you started giving him/her formula, milk or food?	____ weeks **OR** ____ months	____ weeks **OR** ____ months	____ weeks **OR** ____ months
How old was the child when you stopped breast feeding completely?	____ weeks **OR** ____ months	____ weeks **OR** ____ months	____ weeks **OR** ____ months

Pregnancy History (cont.)

	4th Pregnancy	5th Pregnancy	6th Pregnancy
How old were you at the start of your [4th/5th] pregnancy?	_____ age in years	_____ age in years	_____ age in years
In weeks or months, what was the length of this pregnancy?	_____ weeks OR _____ months	_____ weeks OR _____ months	_____ weeks OR _____ months
What was the outcome of that pregnancy? [If **Answer 4 – 8**, skip to next pregnancy.]	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy
Did you breast feed? [*IF **No or Not Applicable**, skip to next pregnancy.]	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*
Did you breast feed using both breasts equally, or more use of the left or right breast?	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know
How old was the child when you started giving him/her formula, milk or food?	_____ weeks OR _____ months	_____ weeks OR _____ months	_____ weeks OR _____ months
How old was the child when you stopped breast feeding completely?	_____ weeks OR _____ months	_____ weeks OR _____ months	_____ weeks OR _____ months

Menstruation and Menopause History

Menstruation (when you start having menstrual periods) and menopause (when you stop having periods or the change of life) are very important times in a woman's life. When these life events occur may cause other body changes. You can use your **Life Events Calendar** to help you complete this section.

1. At what age or year did you have your first menstrual period?

   _____ age **OR** _ _ _ _ year

2. Have your periods ever been regular, that is – you usually knew within one week when your next period would begin, during times when you were **NOT** pregnant or nursing, or using birth control pills, shots (such as Depo-Provera), implants (Norplant) or fertility drugs?

   0. No → **GO TO Question 4**
   1. Yes

   [If NO, skip to question 4.]

3. At what age did your periods become regular?

   _____ age **OR** _ _ _ _ year

4. Now we would like to find out about the pattern of your menstrual periods during certain times of your life.

AGE	On average, how many days was it from the **first day of one period** to the **first day of your next period** (a complete menstrual cycle) when you were [AGE]?	On average, **how heavy were most days** of your menstrual flow when you were [AGE]?
10 – 19 years old	1. Less than 21 days 2. 21 – 25 days 3. 26 – 31 days 4. 32 – 39 days 5. 40 – 50 days 6. More than 50 days 7. Too Irregular 8. Not Applicable/No Periods 9. Don't Know	1. Light 2. Medium 3. Heavy 4. Very Heavy 9. Don't Know
20 – 29 years old	1. Less than 21 days 2. 21 – 25 days 3. 26 – 31 days 4. 32 – 39 days 5. 40 – 50 days 6. More than 50 days 7. Too Irregular 8. Not Applicable/No Periods 9. Don't Know	1. Light 2. Medium 3. Heavy 4. Very Heavy 9. Don't Know

Menstruation and Menopause History (cont.)

AGE	On average, how many days was it from the **first day of one period** to the **first day of your next period** (a complete menstrual cycle) when you were [AGE]?	On average, **how heavy were most days** of your menstrual flow when you were [AGE]?
30 – 39 years old	1. Less than 21 days 2. 21 – 25 days 3. 26 – 31 days 4. 32 – 39 days 5. 40 – 50 days 6. More than 50 days 7. Too Irregular 8. Not Applicable/No Periods 9. Don't Know	1. Light 2. Medium 3. Heavy 4. Very Heavy 9. Don't Know
40 – 49 years old	1. Less than 21 days 2. 21 – 25 days 3. 26 – 31 days 4. 32 – 39 days 5. 40 – 50 days 6. More than 50 days 7. Too Irregular 8. Not Applicable/No Periods 9. Don't Know	1. Light 2. Medium 3. Heavy 4. Very Heavy 9. Don't Know
50 – 59 years old	1. Less than 21 days 2. 21 – 25 days 3. 26 – 31 days 4. 32 – 39 days 5. 40 – 50 days 6. More than 50 days 7. Too Irregular 8. Not Applicable/No Periods 9. Don't Know	1. Light 2. Medium 3. Heavy 4. Very Heavy 9. Don't Know

5. What month and year did you have your **last** period, even if it was some time ago?

__ __ / __ __ __ __
month year

6. What is your current menstrual status?

[If you chose response 1 or 8, skip the rest of this section and go to the Other Menstrual Conditions section on page 12.]

Still having periods:

1. Having regular periods → **GO TO Page 12**
2. Having irregular periods
3. Having periods but possibly beginning menopause (change of life)
4. Still having periods and on hormone medication (hormone/estrogen replacement therapy)

Periods have stopped:

5. By themselves (natural menopause)
6. By surgical removal of uterus (womb) or both ovaries (surgical menopause)
7. By radiation or chemotherapy
8. By hormonal birth control use → **GO TO Page 12**
9. By other medical condition, *Please Specify:*

_____ [__ __]

7. Did you ever or are you currently using hormones either after female surgery or to treat or prevent symptoms of menopause (change of life)?

[If NO or DON'T KNOW, skip to question 9.]

0. No → **GO TO Q. 9**
1. Yes, after female surgery
2. Yes, for menopausal symptoms
9. Don't Know → **GO TO Q. 9**

8. Using these hormones may cause a woman to keep having periods. What was the date of your last menstrual period **before** you started using hormones?

__ __ / __ __ __ __
month year

9. Hot flashes, night sweats, and other symptoms sometimes occur around the time of menopause. Around this time and up to 5 years before menopause, did you have hot flashes, night sweats, or any other symptoms of menopause?

[If NO, NOT APPLICABLE or DON'T KNOW, skip to question 11.]

0. No → **GO TO Q. 11**
1. Yes
8. Not Applicable/Have not reached menopause → **GO TO Q. 11**
9. Don't Know → **GO TO Q. 11**

10. How old were you when you began having these symptoms?

_____ age **OR** _ _ _ _ year

11. Did your doctor or other health care provider ever tell you that you had completed menopause or the change of life?

[If NO or DON'T KNOW, skip question 12 and go to the <u>Other Menstrual Conditions</u> section on page 12.]

0. No → **GO TO Page 12**
1. Yes
9. Don't Know → **GO TO Page 12**

12. How old were you when your doctor or other health provider told you that you had completed menopause?

_____ age **OR** _ _ _ _ year

Menstrual Conditions

1. Now we would like to ask about certain menstrual diseases, conditions, and surgeries that you may have had.

CONDITION	Did a doctor or other health care provider ever tell you that you had any of the following conditions? [*If **NO**, go to the next condition.]	At what age did a doctor first tell you that you had this condition?	Have you ever been hospitalized, had surgery or other procedures, or been prescribed medication for this condition?
1st	Cysts on the ovary? 0. No* 1. Yes	_____ age in years	0. No 1. Yes, Surgery 2. Yes, Prescription medication 3. Yes, Other procedure *Specify*: _____ [__ __] 9. Don't Know
2nd	Endometriosis? 0. No* 1. Yes	_____ age in years	0. No 1. Yes, Surgery 2. Yes, Prescription medication 3. Yes, Other procedure *Specify*: _____ [__ __] 9. Don't Know
3rd	Fibroids, fibroid tumors, or uterine fibroids? 0. No* 1. Yes	_____ age in years	0. No 1. Yes, Surgery 2. Yes, Prescription medication 3. Yes, Other procedure *Specify*: _____ [__ __] 9. Don't Know
4th	Pelvic Inflammatory Disease (PID)? 0. No* 1. Yes	_____ age in years	0. No 1. Yes, Surgery 2. Yes, Prescription medication 3. Yes, Other procedure *Specify*: _____ [__ __] 9. Don't Know

2. Have you ever had a hysterectomy, that is – did you have your womb (uterus) removed, causing your menstrual periods to stop?

   [If NO or DON'T KNOW, skip to question 4.]

   0. No → **GO TO Q. 4**
   1. Yes
   9. Don't Know → **GO TO Q. 4**

3. What month and year did you have the hysterectomy?

   __ __ / __ __ __ __
   month year

4. Have you ever had any surgery where a part of one ovary, a whole ovary, or both of your ovaries were removed? (Please include any surgeries on your ovaries at the time of a hysterectomy and any cysts removed from the ovaries.)

   [IF NO or DON'T KNOW, skip the rest of this section and go to the <u>Contraceptive History</u> section on page 14.]

   0. No → **GO TO Page 14**
   1. Yes
   9. Don't Know → **GO TO Page 14**

5. How many ovarian surgeries have you have?

   _____ # of surgeries

6. Now we would like some additional information about these surgeries.

SURGERY	What exactly was **<u>removed</u>** during the [1st/2nd] surgery on your ovaries?	What month and year did you have the [1st/2nd] surgery on your ovaries?
1st	1. One Ovary (total) 2. One Ovary (partial) 3. Both Ovaries (total) 4. Both Ovaries (partial) 5. Both Ovaries (one total, one partial) 9. Don't Know	__ __ / __ __ __ __ month year
2nd	1. One Ovary (total) 2. One Ovary (partial) 3. Both Ovaries (total) 4. Both Ovaries (partial) 5. Both Ovaries (one total, one partial) 9. Don't Know	__ __ / __ __ __ __ month year
3rd	1. One Ovary (total) 2. One Ovary (partial) 3. Both Ovaries (total) 4. Both Ovaries (partial) 5. Both Ovaries (one total, one partial) 9. Don't Know	__ __ / __ __ __ __ month year

Contraceptive History

The next questions are about methods of family planning or birth control that you or your partner may have used.

1. Have you or any partner ever used any methods of birth control?

   [IF NO, skip the rest of this section and go to the Hormone Medication History section on page 16.]

   0. No → **GO TO Page 16**
   1. Yes

2. Have you and any partner ever used any of the following birth control methods:

1. Condoms or rubbers	0. No	1. Yes	9. Don't Know
2. Diaphragm, cap, or sponge	0. No	1. Yes	9. Don't Know
3. Foam, jelly, cream, or suppositories	0. No	1. Yes	9. Don't Know
4. Rhythm, calendar, ovulation, or withdrawal	0. No	1. Yes	9. Don't Know
5. Tubes tied, tubal sterilization, female sterilization	0. No	1. Yes	9. Don't Know
6. Vasectomy or male sterilization or surgery	0. No	1. Yes	9. Don't Know
7. Birth control pills (BCs)	0. No	1. Yes	9. Don't Know
8. Birth control shots or injections (i.e., Depo-Prevera)	0. No	1. Yes	9. Don't Know
9. Subdermal (under the skin) implants (i.e., Norplant)	0. No	1. Yes	9. Don't Know
10. IUD or intrauterine device such as a loop or coil	0. No	1. Yes	9. Don't Know
11. Any other method	0. No	1. Yes, *Please Specify:* _____ [__]	

[If NO to questions 7, 8, 9, AND 10 above, skip the rest of this section and go to the Hormone Medication History section on page 16.]

3. We are particularly interested in any birth control methods that you may have used that contained hormones. Certain hormones in contraceptives can affect the level of hormones that your body makes.

   For all hormonal contraceptives you have **EVER** used, we would like to ask you what type it was (birth control pill, shot, injection or implant) and when you started and stopped using that particular type of contraceptive. Remember to look at your **Life Events Calendar** to help you answer these questions.

TYPE	What was the [1st/2nd] type of contraceptive (birth control) you took?	What month and year did you **START** taking this contraceptive?	What month and year did you **STOP** taking this contraceptive? **[Write present date if currently taking medication.]**
1st	1. Birth control pills 2. Birth control shots or injections 3. Subdermal implants 9. Don't Know	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
2nd	1. Birth control pills 2. Birth control shots or injections 3. Subdermal implants 9. Don't Know	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
3rd	1. Birth control pills 2. Birth control shots or injections 3. Subdermal implants 9. Don't Know	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
4th	1. Birth control pills 2. Birth control shots or injections 3. Subdermal implants 9. Don't Know	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
5th	1. Birth control pills 2. Birth control shots or injections 3. Subdermal implants 9. Don't Know	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
6th	1. Birth control pills 2. Birth control shots or injections 3. Subdermal implants 9. Don't Know	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
7th	1. Birth control pills 2. Birth control shots or injections 3. Subdermal implants 9. Don't Know	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year

Hormone Medication History

We would like to ask you questions about any hormone medications that you might have used before or around menopause and then any other hormone medications such as those be used to treat certain conditions of the breasts, ovaries, or uterus. Please do not include any birth control pills, IUDs, shots, or implants that you have already mentioned. Please use your **Life Events Calendar** to help you answer this section.

1. Have you ever used any hormone medications just before the start of menopause, around the time of menopause, or after menopause?

   [IF NO or NOT APPLICABLE, skip to question 3.]

   0. No → **GO TO Q. 3**
   1. Yes
   8. Not Applicable/Have not reached menopause → **GO TO Q. 3**

2. For each type of hormone medication you took **around the time of menopause**, we would like to ask the name of the hormone medication you took, reasons for taking that hormone [you may choose more than one] and the dates you started and stopped taking it.

TYPE	What was the name of the [1st/2nd] type of hormone medication you took? [Write **"DK"** if you Don't Know the name.]	Which of the following were reasons you took this medication? **[Please circle all that apply for each medication.]**	What month and year did you **START** taking this hormone medication?	What month and year did you **STOP** taking this hormone medication? **[Write present date if currently taking medication.]**
1st	_____ [__ __]	1. Irregular menstrual bleeding 2. Heavy menstrual bleeding 3. Delay of menopause/change of life 4. Hot flashes 5. Sweating 6. Vaginal dryness 7. Bladder problems 8. Depression or anxiety 9. After uterus or ovary removal 10. Prevention/treatment of bone loss 11. Prevention/treatment of heart disease 12. Other reason, *please specify*: _____ [__]	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
2nd	_____ [__ __]	1. Irregular menstrual bleeding 2. Heavy menstrual bleeding 3. Delay of menopause/change of life 4. Hot flashes 5. Sweating 6. Vaginal dryness 7. Bladder problems 8. Depression or anxiety 9. After uterus or ovary removal 10. Prevention/treatment of bone loss 11. Prevention/treatment of heart disease 12. Other reason, *please specify*: _____ [__]	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year

3. Have you ever used any other type of hormone medications that you have **NOT** already mentioned to treat, for example, severe menstrual cramps, acne, or ovarian or breast problems?

0. No → **GO TO Page 18**
1. Yes

[If NO, skip the rest of this section and go to the Body section on page 18.]

4. For hormone medications you have **NOT** already mentioned, we would like to ask the type of hormone medication you took, reasons for taking that hormone [you may choose more than one] and the dates you started and stopped taking it. Please do not include any birth control pills, shots, or implants that you have already mentioned.

TYPE	What was the name of the [1st/2nd] type of other hormone medication you took? [Write **"DK"** if you Don't Know the name.]	Which of the following were reasons you took this medication? **[Please circle all that apply for each medication.]**	What month and year did you **START** taking this hormone medication?	What month and year did you **STOP** taking this hormone medication? **[Write present date if currently taking medication.]**
1st	_____ [__]	1. Acne 2. Excessive hair growth or hirsutism 3. Endometriosis 4. To promote pregnancy/fertility 5. To prevent miscarriage 6. Problems with ovaries (i.e., cysts) 7. Polycystic ovarian disease 8. Breast tenderness or pain 9. Benign breast lumps or cysts 10. Premenstrual syndrome (PMS) 11. Severe menstrual cramps 12. Heavy menstrual bleeding 13. Other reason, *please specify*: _____ [__]	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year
2nd	_____ [__]	1. Acne 2. Excessive hair growth or hirsutism 3. Endometriosis 4. To promote pregnancy/fertility 5. To prevent miscarriage 6. Problems with ovaries (i.e., cysts) 7. Polycystic ovarian disease 8. Breast tenderness or pain 9. Benign breast lumps or cysts 10. Premenstrual syndrome (PMS) 11. Severe menstrual cramps 12. Heavy menstrual bleeding 13. Other reason, *please specify*: _____ [__]	__ __ / __ __ __ __ month year	__ __ / __ __ __ __ month year

Body Image

We would like to ask you some questions about your weight and body at different times in your life. How your body size changes through your life can be related to other body processes. You can use the **Life Events Calendar** to help you complete this section.

1. For each age period, we would like to know the weight group that would best describe your weight at that age, your average weight and using the **Body Size Picture (Item C)**, which body picture (# 1 – 9) best shows your body size at that time (during adult age periods only).

AGE	What was your weight group **AND** average weight in pounds when you were [AGE]? [Write "**DK**" if you Don't Know your weight at that time.]	Which Body Picture # (see Item C) best shows your body size when you were [AGE]?
8 –10 years old (Late Elementary School)	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	
11 – 13 years old (Middle/Junior High School)	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	
14 – 19 years old (High School/Late Teens)	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
20 – 24 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
25 – 29 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
30 – 34 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Very overweight 9. Don't Know	_____

Body Image (cont.)

AGE	What was your weight group **AND** average weight in pounds when you were [AGE]? [Write "**DK**" if you Don't Know your weight at that time.]	Which Body Picture # (see Item C) best shows your body size when you were [AGE]?
35 – 39 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
40 – 44 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
45 – 49 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
50 – 59 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
60 – 69 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
70 – 79 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____
80 – 89 years old	1. Underweight 2. Slightly underweight 3. Average weight 4. Slightly overweight **AND** _____ pounds 5. Overweight 9. Don't Know	_____

2. Were you teased in **elementary school** for being underweight?
   0. No
   1. Yes

3. Were you teased in **elementary school** for being overweight?
   0. No
   1. Yes

4. Were you teased in **middle school** for being underweight?
   0. No
   1. Yes

5. Were you teased in **middle school** for being overweight?
   0. No
   1. Yes

6. Were you teased in **high school** for being underweight?
   0. No
   1. Yes

7. Were you teased in **high school** for being overweight?
   0. No
   1. Yes

8. What has been your maximum height in feet and inches?
   _____ feet _____ inches

9. Are you left-handed, right-handed, or able to use both hands equally (ambidextrous)?
   1. Left handed
   2. Right handed
   3. Use both hands equally

Alcohol Consumption

Now we would like some information on your use of alcoholic beverages.

1. Have you ever drunk alcoholic beverages, such as beer, wine, or mixed drinks, at least once a month for 6 months or more?
   0. No → **GO TO Page 22**
   1. Yes

[If NO, skip the rest of this section and go to the Tobacco History section on page 22.]

2. Now we would like to find out about your average drinking habits during different decades of your life. [If you **did not drink** any beer, wine or mixed drinks in a decade, please write the amount as '**0**'.]

AGE	How many **Beers** did you usually drink in a day, week or month when you were [AGE]? **[Circle how often.]**	How many **Glasses of Wine** did you usually drink in a day, week or month when you were [AGE]? **[Circle how often.]**	How many **Mixed Drinks** did you usually drink in a day, week or month when you were [AGE]? **[Circle how often.]**	Did your tend to spread your drinks throughout the day/week/month or did you drink many drinks at one time?
10 – 19 years old	_____ **PER** 1. Day 2. Week 3. Month Beers	_____ **PER** 1. Day 2. Week 3. Month Wine	_____ **PER** 1. Day 2. Week 3. Month Drinks	1. Spread out 2. Many at one time 9. Don't Know
20 – 29 years old	_____ **PER** 1. Day 2. Week 3. Month Beers	_____ **PER** 1. Day 2. Week 3. Month Wine	_____ **PER** 1. Day 2. Week 3. Month Drinks	1. Spread out 2. Many at one time 9. Don't Know
30 – 39 years old	_____ **PER** 1. Day 2. Week 3. Month Beers	_____ **PER** 1. Day 2. Week 3. Month Wine	_____ **PER** 1. Day 2. Week 3. Month Drinks	1. Spread out 2. Many at one time 9. Don't Know
40 – 49 years old	_____ **PER** 1. Day 2. Week 3. Month Beers	_____ **PER** 1. Day 2. Week 3. Month Wine	_____ **PER** 1. Day 2. Week 3. Month Drinks	1. Spread out 2. Many at one time 9. Don't Know
50 – 59 years old	_____ **PER** 1. Day 2. Week 3. Month Beers	_____ **PER** 1. Day 2. Week 3. Month Wine	_____ **PER** 1. Day 2. Week 3. Month Drinks	1. Spread out 2. Many at one time 9. Don't Know
60 – 69 years old	_____ **PER** 1. Day 2. Week 3. Month Beers	_____ **PER** 1. Day 2. Week 3. Month Wine	_____ **PER** 1. Day 2. Week 3. Month Drinks	1. Spread out 2. Many at one time 9. Don't Know
70 – 79 years old	_____ **PER** 1. Day 2. Week 3. Month Beers	_____ **PER** 1. Day 2. Week 3. Month Wine	_____ **PER** 1. Day 2. Week 3. Month Drinks	1. Spread out 2. Many at one time 9. Don't Know

Tobacco History

Now we would like some information on your use of tobacco products.

1. Have you ever smoked a total of 100 cigarettes or more in your life?

0. No → **GO TO Q. 3**
1. Yes

[If NO, skip to question 3 on page 23.]

2. We would like to find out your smoking patterns during different time periods in your life.

AGE	Did you smoke when you were [AGE]? [*If **NO**, skip to next age period.]	How many years did you smoke during this age period?	On average, how many cigarettes did you smoke **EACH DAY** (during the years you smoked)?	Did anyone living with you at that time smoke? [*If **NO**, skip to next age period.]	How many years during this period did they smoke?
8 – 10 years old (Late Elementary School)	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
11 – 13 years old (Middle/Junior High School)	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
14 – 19 years old (High School/ Late Teens)	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
20 – 29 years old	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
30 – 39 years old	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
40 – 49 years old	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years

Tobacco History (cont.)

AGE	Did you smoke when you were [AGE]? [*If **NO**, skip to next age period.]	How many years did you smoke during this age period?	On average, how many cigarettes did you smoke **EACH DAY** (during the years you smoked)?	Did anyone living with you at that time smoke? [*If **NO**, skip to next age period.]	How many years during this period did they smoke?
50 – 59 years old	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
60 – 69 years old	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
70 – 79 years old	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years
80 – 89 years old	0. No* 1. Yes	_____ years	1. Less than 3 cigarettes 2. 3 – 9 cigarettes 3. Half a pack (10) 4. One pack (20) 5. 1 ½ - 2 packs 6. More than 2 packs	0. No* 1. Yes	_____ years

3. Have you ever dipped snuff or chewed tobacco?

   [If NO, skip questions 4 and 5 and go to the <u>Physical Activity</u> section on page 24.]

   0. No → **GO TO Page 24**
   1. Yes

4. How many years did you dip snuff or chew tobacco?

   _____ years

5. How many times per day or week did you dip snuff or chew tobacco? [Answer in either Days **OR** Weeks.]

   _____ days **OR** _____ weeks

Physical Activity

We are interested in physical activities you have participated in during your lifetime. Specifically, we would like to ask you about your work, household and exercise activities starting with your earliest activities to the most recent. You can use the **Life Events Calendar** and the examples we have included in each table to help you complete these sections.

Work Physical Activity

1. Have you ever held a job outside the home for more than one month?

   0. No → **GO TO Page 26**
   1. Yes

   [If NO, skip the rest of this section go to the Household Physical Activity section on page 26.]

2. Now we would like to know about the level and amount of physical activity you have had at certain jobs. We will focus on jobs you have had for **at least 8 hours per week for 4 months of the year (128 hours per year or 2.5 hours per week per year)** over your lifetime, starting with your first job. Please do not include a job if you did not work on it for at least this amount of time.

   For each job, we would like to know your job title, what type of tasks you did on that job (i.e., typing, operating cash register, indoor painting), how old you were when you started and stopped that job, and the number of months per year, days per week, hours per day that you worked that job. Finally, we would like to know the physical intensity involved with the job. You can choose an intensity level for each job from the following:

Intensity Levels	Description
1. sedentary	mostly sitting with minimal walking
2. light	some standing and slow walking with little physical effort
3. moderate	continuous walking and carrying light loads with light sweating
4. heavy	using heavy equipment and carrying heavy loads with heavy sweating

JOB	What was the title of your [1st/2nd] job?	Can you briefly describe what type of tasks you did for this job?	**OFFICE USE ONLY**	What age did you **START** this job?	What age did you **STOP** this job?	Months per Year	Days per Week	Time per Day		Intensity Level (1,2,3,4)
								Hrs	Min	
Example	File Clerk	-filed papers -answered phone		18	22	12	5	8	0	2
1st										
2nd										

Work Physical Activity (cont.)

JOB	What was the title of your [3rd/4th] job?	Can you briefly describe what type of tasks you did for this job?	**OFFICE USE ONLY**	What age did you **START** this job?	What age did you **STOP** this job?	Months per Year	Days per Week	Time per Day		Intensity Level (1,2,3,4)
								Hrs	Min	
3rd										
4th										
5th										
6th										
7th										
8th										
9th										
10th										
11th										
12th										
13th										

Household Physical Activity

1. Now we are going to ask you about your pattern of household and gardening activities during your lifetime. We will focus on activities you did for **at least 7 hours per week for 4 months of the year (112 hours per year or 2.15 hours per week per year)** over your lifetime based on intensity level, starting with your first household and gardening activities. Please do not include activities you performed for less than this time.

   It may help to consider what a typical day or week was like for you. Then think about the type of activities that you did in a typical day or week and how physically involved they were. For each of the physical intensity levels listed (light, moderate and heavy), record the types of activities performed at that level, the start and stop ages you performed those activities, and the number of months per year, days per week and hours per day you performed those activities. If the intensity level, start/stop ages or amount of time for an activity changed, record as a new type of household activity. Examples at each intensity level are listed below:

Intensity Levels:	Examples:
2. light (little physical effort)	ironing, washing dishes, cooking, laundry, vacuuming
3. moderate (light sweating)	scrubbing/polishing floors, mowing the lawn
4. heavy (heavy sweating)	moving furniture, digging a garden, home improvements

INTENSITY LEVEL	What was the 1st/2nd type of light/moderate/ heavy household activity you did?	**OFFICE USE ONLY**	What age did you **START** this activity?	What age did you **STOP** this activity?	Months per Year	Days per Week	Time per Day		Intensity Level (2,3,4)
							Hrs	Min	
Example: LIGHT	Cooking, washing dishes, laundry		13	42 (current age)	12	4	2	30	2
1st LIGHT									2
2nd LIGHT									2
1st MODERATE									3
2nd MODERATE									3
1st HEAVY									4
2nd HEAVY									4

Exercise, Sports and Hobby Activity

1. As our last type of physical activity, we would like to know about exercise, sports and hobby activities that you did during your lifetime starting with your childhood to your most recent activities. We will focus on exercise, sports or hobby activities you have done **at least 10 times during your lifetime** and for **at least 2 hours per week for 4 months of the year (32 hours per year or 40 minutes per week per year)**. Please do not include an activity if you did not do it for at least this amount of time.

   Besides sports and exercise, we are also interested in knowing whether you walked or biked to work or school which you can include information on as you did with the other sports activities. For each of the physical intensity levels listed (sedentary, light, moderate and heavy), record the types of activities performed at that level, the start and stop ages you performed those activities, and the number of months per year, days per week and hours per day you performed those activities. If the intensity level, start/stop ages or amount of time for an activity changed, record as a new activity. Please begin by reporting the activities that you did during your school years including your gym classes. Examples at each intensity level are listed below:

Intensity Levels:	Examples:
1. sedentary (little physical effort)	knitting, jewelry making, basket weaving
2. light (some physical effort)	slow walking, golfing, bowling
3. moderate (light sweating)	fast walking, jogging, swimming
4. heavy (heavy sweating)	aerobics, running, tennis, basketball

INTENSITY LEVEL	What was the [1st/2nd] type of sedentary/light exercise activity you did?	**OFFICE USE ONLY**	What age did you **START** this activity?	What age did you **STOP** this activity?	Months per Year	Days per Week	Time per Day		Intensity Level (2,3,4)
							Hrs	Min	
Example: MODERATE	Gym class in high school		14	17	9	5		45	3
1st SEDENTARY									1
2nd SEDENTARY									1
3rd SEDENTARY									1
4th SEDENTARY									1
5th SEDENTARY									1
1st LIGHT									2

Exercise, Sports and Hobby Activity (cont.)

INTENSITY LEVEL	What was the [1st/2nd] type of light/moderate/ heavy exercise activity you did?	**OFFICE USE ONLY**	What age did you **START** this activity?	What age did you **STOP** this activity?	Months per Year	Days per Week	Time per Day		Intensity Level (2,3,4)
							Hrs	Min	
2nd LIGHT									2
3rd LIGHT									2
4th LIGHT									2
5th LIGHT									2
1st MODERATE									3
2nd MODERATE									3
3rd MODERATE									3
4th MODERATE									3
5th MODERATE									3
1st HEAVY									4
2nd HEAVY									4
3rd HEAVY									4
4th HEAVY									4
5th HEAVY									4

Agricultural History

1. Have you ever lived or worked on a farm for more than 6 months?

   [If NO, skip the rest of this section and go to Family History section on page 30.]

   0. No → **GO TO Page 30**
   1. Yes

2. Did you ever live or work on a farm where insecticides (insect killing chemicals) were used on livestock, crops, farm buildings or lots?

   [If NO, skip to question 5.]

   0. No → **GO TO Q. 5**
   1. Yes

3. What was the total number of years insecticides were used on the farm?

   _____ years

4. How many times per year were they used during this period?

   _____ times per year

5. Did you ever live or work on a farm where herbicides (weed and plant killing chemicals) were used?

   [If NO, skip to question 8.]

   0. No → **GO TO Q. 8**
   1. Yes

6. What was the total number of years herbicides were used on the farm?

   _____ years

7. How many times per year were they used during this period?

   _____ times per year

8. Did you ever live or work on a farm where fungicides (fungus killing chemicals) were used?

   [If NO, skip the rest of this section and go to the Family History section on page 30.]

   0. No → **GO TO Page 30**
   1. Yes

9. What was the total number of years fungicides were used on the farm?

   _____ years

10. How many times per year were they used during this period?

    _____ times per year

Family History

Now we would like to get some information on your family history. A family history of cancer, that is having close relatives who have had cancer, has been shown to be related to some, but not all, cancers. We are interested in relatives who are living or dead and related to you by blood. Use your **Life Events Calendar** to help you with this section. [If you have more than four relatives of the same kind (i.e., six sisters), record the additional information for those relatives on the **Continuation Pages for Family History (Item B)**.]

1. Did any of your biologic relatives ever have cancer?
   0. No relatives with cancer → **GO TO Page 36**
   1. No, family history unknown → **GO TO Page 36**
   2. Yes

[If NO, skip the rest of this section and go to the Mother's Prenatal History section on page 36.]

2. First we would like to get some information about your **mother's and grandmothers'** history of cancer.

RELATIVE	Is your [relative] still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of her death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	What age (years or decade) was this cancer first diagnosed? [Write **"DK"** if you Don't Know.]
Mother	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Mother's Mother	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Father's Mother	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

3. How many **sisters** (both full and half) do/did **you** have? _____

[If NONE [0] or DON'T KNOW, skip to question 5.]

4. Now we would like to get some information about your **sisters'** history of cancer.

RELATIVE	Is your [1st/2nd] sister still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of her death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	What age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Sister 1	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Sister 2	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Sister 3	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Sister 4	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Melanoma 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

5. How many **sisters** (both full and half) does/did your **mother** have? _____

[If NONE [0] or DON'T KNOW, skip to question 7.]

6. Now we would like to get some information about your **mother's sisters'** history of cancer.

RELATIVE	Is your mother's [1st/2nd] sister still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of her death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	What age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Mother's Sister 1	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Mother's Sister 2	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Mother's Sister 3	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Mother's Sister 4	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

7. How many **sisters** (both full and half) does/did your **father** have? _____

[If NONE [0] or DON'T KNOW, skip to question 9.]

8. Now we would like to get some information about your **father's sisters'** history of cancer.

RELATIVE	Is your father's [1st/2nd] sister still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of her death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	What age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Father's Sister 1	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Father's Sister 2	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Father's Sister 3	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Father's Sister 4	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

9. How many **daughters** do/did **you** have? _____

[If NONE [0] or DON'T KNOW, skip to question 11.]

10. Now we would like to get some information about your **daughters'** history of cancer.

RELATIVE	Is your [1st/2nd] daughter still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of her death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	What age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Daughter 1	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Daughter 2	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Daughter 3	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Daughter 4	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

Now we would like to get some information about any men in your family who may have had prostate cancer.

11. Were any of your male relatives, such as your grandfathers, father or brothers, ever diagnosed with prostate cancer?

0. No → **GO TO Page 36**
1. Yes
9. Don't Know → **GO TO Page 36**

[If NO or DON'T KNOW, skip the rest of this section and go to the Mother's Prenatal History section on page 36.]

12. We are interested in knowing which male relatives (father, brothers, grandfathers, father's brothers, etc.) were diagnosed with prostate cancer and the age, in years or decade (i.e., 60s or 70s), they were diagnosed.

RELATIVE	What is your relationship to the [1st/2nd] male family member diagnosed with prostate cancer?	**OFFICE USE ONLY**	What age (years or decade) was he diagnosed with prostate cancer? [Write **"DK"** if you Don't Know.]
1st			_____ years or decade
2nd			_____ years or decade
3rd			_____ years or decade
4th			_____ years or decade
5th			_____ years or decade
6th			_____ years or decade
7th			_____ years or decade
8th			_____ years or decade

Mother's Prenatal History

Now we would like to get some information about your mother when she was pregnant with you. It is possible that some prenatal events may affect the health of the baby later on.

1. How old was your mother when you were born?

   _____ age

2. How many live birth pregnancies did your mother have before you were born?

   _____ # of live births

3. How many stillbirth pregnancies did your mother have before you were born?

   _____ # of stillbirths

4. Before you were born, how many of your mother's pregnancies were twins or multiple births?

   _____ # of multiple birth pregnancies

5. Were you a twin or part of a multiple birth (triplets, quadruplets, etc.)?

   [If NO, go to question 8.]

   0. No → **GO TO Q. 8**
   1. Yes

6. Were you and your twin (or multiple birth siblings) identical?

   0. No
   1. Yes

7. Was your twin (or any of your multiple birth siblings) female?

   0. No
   1. Yes

8. When you were born, did you weigh less than 5½ pounds, between 5½ and 9 pounds, or more than 9 pounds?

   1. Less than 5 ½ pounds
   2. 5 ½ - 9 pounds
   3. More than 9 pounds
   9. Don't Know

9. Did your mother smoke cigarettes when she was pregnant with you?

   0. No
   1. Yes
   9. Don't Know

10. Did your mother take a medicine to prevent miscarriage, such as diesthylstilbesterol (DES), when she was pregnant with you?

    0. No
    1. Yes, DES
    2. Yes, Other medicine
    9. Don't Know

Household Information

1. Including income provided by you, your spouse/partner, and any other persons living in your household, what was your total household income before taxes last year?

   1. Less than $10,000
   2. $10,000 - $19,999
   3. $20,000 - $34,999
   4. $35,000 - $49,999
   5. $50,000 - $74,999
   6. $75,000 or more

2. How many people, including yourself, were supported by your total household income last year?

   1. 1
   2. 2
   3. 3
   4. 4
   5. 5
   6. 6
   7. More than 6

3. Do you rent or own your home?

   1. Rent apartment/house
   2. Own condominium/house

4. How much is your monthly payment?

   $_____ per month

5. What is your social security number?

   ___ -- ___ -- ____

Contact Information

It would be a great help to us if you could provide the names and addresses of two people who you **DO NOT** live with that would remain in contact with you if you should move. We would only contact these individuals if we were unable to reach you at your home address.

1. Name of Contact_____

   Street Address_____

   City_____ State _____ Zip Code _____

   Area Code and Phone Number (_ _ _) _ _ _ -- _ _ _ _

   Relationship to you_____ [_ _]

2. Name of Contact_____

   Street Address_____

   City_____ State _____ Zip Code_____

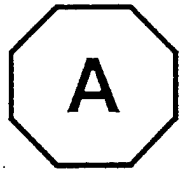
   Area Code and Phone Number (_ _ _) _ _ _ -- _ _ _ _

   Relationship to you_____ [_ _]

Thank you for completing the *Women's Health Study* Life History Survey. Please return the:

- ✓ **Life History Survey**
- ✓ **Continuation Pages for Pregnancy and Family History (Item B)**

in the self-addressed postage-paid envelope to Henry Ford Health System, Department of Biostatistics and Research Epidemiology, One Ford Place, Suite 3E, Detroit MI 48202-3450. If you have questions or need help completing the survey, please call (313) 864-6232.



WOMEN'S HEALTH STUDY

LIFE EVENTS CALENDAR

Thank you for participating in our study. To help tell us about yourself, we suggest that you fill in the attached table with important times in your life before completing the **Life History Survey**. As part of the survey, we will be asking you about various events in your life including your medical history, pregnancies, lifestyle, jobs, physical activity and your family history of cancer.

To fill in the table, you can list where you lived in the first (left hand) column, important life events in the second column (e.g. weddings, births, medical diagnoses), your education and jobs held in the third column, and any physical activities that you did in the final (right hand) column.

Please write in the attached table at what ages the following life events and activities happened in your life:

- Pregnancies*
- Menses (start of menstrual cycles) and menopause (end of menstrual cycles), if applicable*
- Diagnosis of medical conditions or surgeries performed*
- Weight changes*
- Alcohol and tobacco use throughout your life*
- Jobs held*
- Household, exercise and sports activities done throughout your life*
- Any diagnoses of cancer among your family members*

It may help you to remember the above events if you also record these items:

- Personal events such as weddings, births, deaths in family
- Places lived at different ages including moves to different places and homes

Please note that we will only be asking you about the items that have an asterisk (*) next to them.

This is a shortened example of what a completed life events calendar might look like:

Year	Age	Residence List city and state, and country, if outside the U.S.	Life Events List weddings, pregnancies, births, deaths, surgeries, cancer diagnoses, etc.	Education and Job History List when you did your education and all the jobs that you held.	Physical Activity History List leisure physical activities that you did at least 10 times during your lifetime.
1940-45	0-5	Detroit, MI	Born in 1940; sister born in 1945		
1946-50	6-10			Elementary School	Played baseball once a week
1952-55	12-15		Menstrual cycle began at age 13	Junior High School	Daily gym class
1955-58	15-18			High School; worked as a camp counselor during summers	Cheerleader, daily gym class
1958-62	18-22	Ann Arbor, MI	Grandmother diagnosed with breast cancer	College	Weekly swimming, rode bike to class
1963	23	Southfield, MI	Got married	Started working as teacher	Took up tennis (1 –2 times per week)
1970	30		First child was born		
1973	33		Second child was born		Started cross country skiing (4 – 6 times per month in the winter)
1984	44	Birmingham, MI	Father died	Promoted to principal	
1986	46				Stopped cross country skiing
1992	52		Started going through menopause		
1997	57		Uncle diagnosed with prostate cancer		Started walking daily

Please fill in all important events in your life. These reference points will be useful when answering the questions in the survey. You can fill in the calendar in whatever order is best for you.

Year	Age	**Residence** List city and state, and country, if outside the U.S.	**Life Events** List weddings, pregnancies, births, deaths, surgeries, cancer diagnoses, etc.	**Education and Job History** List when you did your education and all the jobs that you held.	**Physical Activity History** List leisure physical activities that you did at least 10 times during your lifetime.
	0-5				
	6-10				
	11-12				
	13				
	14				
	15				
	16				
	17				
	18				
	19				
	20				
	21				
	22				
	23				
	24				

Year	Age	Residence List city and state, and country, if outside the U.S.	Life Events List weddings, pregnancies, births, deaths, surgeries, cancer diagnoses, etc.	Education and Job History List when you did your education and all the jobs that you held.	Physical Activity History List leisure physical activities that you did at least 10 times during your lifetime.
	25				
	26				
	27				
	28				
	29				
	30				
	31				
	32				
	33				
	34				
	35				
	36				
	37				
	38				
	39				

Year	Age	Residence List city and state, and country, if outside the U.S.	Life Events List weddings, pregnancies, births, deaths, surgeries, cancer diagnoses, etc.	Education and Job History List when you did your education and all the jobs that you held.	Physical Activity History List leisure physical activities that you did at least 10 times during your lifetime.
	40				
	41				
	42				
	43				
	44				
	45				
	46				
	47				
	48				
	49				
	50				
	51				
	52				
	53				
	54				

Year	Age	**Residence** List city and state, and country, if outside the U.S.	**Life Events** List weddings, pregnancies, births, deaths, surgeries, cancer diagnoses, etc.	**Education and Job History** List when you did your education and all the jobs that you held.	**Physical Activity History** List leisure physical activities that you did at least 10 times during your lifetime.
	55				
	56				
	57				
	58				
	59				
	60				
	61				
	62				
	63				
	64				
	65				
	66				
	67				
	68				
	69				

Year	Age	Residence List city and state, and country, if outside the U.S.	Life Events List weddings, pregnancies, births, deaths, surgeries, cancer diagnoses, etc.	Education and Job History List when you did your education and all the jobs that you held.	Physical Activity History List leisure physical activities that you did at least 10 times during your lifetime.
	70				
	71				
	72				
	73				
	74				
	75				
	76				
	77				
	78				
	79				
	80				
	81				
	82				
	83				
	84				

B

FOR OFFICE USE ONLY:	
Study ID:	_ _ _ _ _ _ _ _ _
Survey mail date:	_ _ / _ _ / _ _ _ _
Survey comp. date:	_ _ / _ _ / _ _ _ _
Interviewer ID:	_ _ _
Outcome Code:	_____

WOMEN'S HEALTH STUDY

CONTINUATION PAGES

Pregnancy History

Family History

Continuation Pages: Pregnancy History

If you have had more than 6 pregnancies, use these pages to record information on those pregnancies. Remember to include live births, stillbirths, miscarriages, abortions, and tubal (in the tubes) and other ectopic (outside the womb) pregnancies. For each pregnancy, record your age at the time of the pregnancy, outcome of the pregnancy, length of time in either weeks or months, and your breast feeding patterns, if applicable.

	7th Pregnancy	8th Pregnancy	9th Pregnancy
How old were you at the Start of your [7th/8th] pregnancy?	_____ age in years	_____ age in years	_____ age in years
In weeks or months, what was the length of this pregnancy?	_____ weeks **OR** _____ months	_____ weeks **OR** _____ months	_____ weeks **OR** _____ months
What was the outcome of that pregnancy? [If **Answer 4 – 8**, skip to next pregnancy.]	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy
Did you breast feed? [*IF **No or Not Applicable**, skip to next pregnancy.]	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*
Did you breast feed using both breasts equally, or more use of the left or right breast?	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know
How old was the child when you started giving him/her formula, milk or food?	_____ weeks **OR** _____ months	_____ weeks **OR** _____ months	_____ weeks **OR** _____ months
How old was the child when you stopped breast feeding completely?	_____ weeks **OR** _____ months	_____ weeks **OR** _____ months	_____ weeks **OR** _____ months

	10th Pregnancy	11th Pregnancy	12th Pregnancy
How old were you at the start of your [10th/11th] pregnancy?	______ age in years	______ age in years	______ age in years
In weeks or months, what was the length of this pregnancy?	______ weeks OR ______ months	______ weeks OR ______ months	______ weeks OR ______ months
What was the outcome of that pregnancy? [If **Answer 4 – 8**, skip to next pregnancy.]	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy	1. Single Live Birth 2. Multiple Birth, Any Living 3. Multiple Birth, None Living 4. Stillbirth 5. Miscarriage, Doctor Confirmed 6. Miscarriage, Not Confirmed 7. Induced Abortion 8. Ectopic or Tubal Pregnancy
Did you breast feed? [*IF **No or Not Applicable**, skip to next pregnancy.]	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*	0. No* 1. Yes 8. Not Applicable*
Did you breast feed using both breasts equally, or more use of the left or right breast?	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know	1. Equal 2. Left 3. Right 9. Don't Know
How old was the child when you started giving him/her formula, milk or food?	______ weeks OR ______ months	______ weeks OR ______ months	______ weeks OR ______ months
How old was the child when you stopped breast feeding completely?	______ weeks OR ______ months	______ weeks OR ______ months	______ weeks OR ______ months

Continuation Pages: Family History

If you have more than 4 sisters or daughters, or your father or mother have more than 4 sisters, please record their history on these pages.

1. Your **sisters'** history of cancer.

RELATIVE	Is your [5th/6th] sister still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of her death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	At what age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Sister 5	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Sister 6	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Sister 7	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Sister 8	0. No 1. Yes* 9. Don't Know	_____ Years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Melanoma 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

2. Your **mother's sisters'** history of cancer.

RELATIVE	Is your mother's [5th/6th] sister still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	At what age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Mother's Sister 5	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Mother's Sister 6	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Mother's Sister 7	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Mother's Sister 8	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Melanoma 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

3. Your **father's sisters'** history of cancer.

RELATIVE	Is your father's [5th/6th] sister still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	At what age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Father's Sister 5	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Father's Sister 6	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Father's Sister 7	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Father's Sister 8	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Melanoma 8. Lung 9. Other, *Specify*: _____ [___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

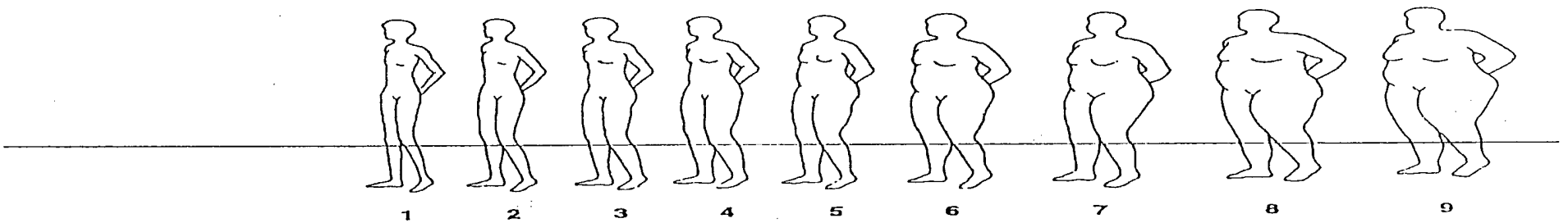
4. Your **daughters'** history of cancer.

RELATIVE	Is your [5th/6th] daughter still living? [*If **YES**, skip next question.]	How old (years or decade) was she at the time of death?	Did she ever have cancer? [*If **NO or DON'T KNOW**, skip to the next relative.]	What type(s) of cancer did she have? **[Circle all that apply.]**	At what age (years or decade) was this cancer diagnosed? [Write **"DK"** if you Don't Know.]
Daughter 5	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Daughter 6	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Daughter 7	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Skin (melanoma) 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade
Daughter 8	0. No 1. Yes* 9. Don't Know	_____ years or decade	0. No* 1. Yes 9. Don't Know*	1. Breast 2. Ovarian 3. Cervical 4. Uterine 5. Unknown female genital organ 6. Colorectal 7. Melanoma 8. Lung 9. Other, *Specify*: _____[___]	_____ _____ _____ _____ _____ _____ _____ _____ _____ years or decade

C

WOMEN'S HEALTH STUDY

BODY SIZE PICTURE



BENIGN BREAST DISEASE PATHOLOGY REVIEW FORM

PLACE LABEL HERE:
MRN
Pathology # Specimen #
Date of Pathology Report

PRF Outcome:
☐1 BBD
☐2 CIS
☐3 Cancer
☐4 No Tissue

BIOPSY REVIEWER

☐0 No ☐1 Yes Usha Raju
☐0 No ☐1 Yes Varsha Shah
☐0 No ☐1 Yes Sandra Wolman
☐0 No ☐1 Yes Murali Verma

FORM COMPLETION DATE

__ __ / __ __ / __ __ __ __

TYPE OF BIOPSY

☐1 Needle
☐2 Excision
☐3 Simple Mastectomy
☐4 Modified Radical Mastectomy
☐7 Other_____
☐9 Unknown

LOCALIZATION

☐0 No
☐1 Yes
Diagnostic Concordance:
☐1 Definite ☐2 Probable ☐3 Uncertain _____
☐9 Unknown

LOCATION OF BREAST BIOPSY

☐1 Left
☐2 Right
☐3 Both
☐9 Unknown

LOCALIZATION MARKER

☐0 No ☐1 Yes Dye
☐0 No ☐1 Yes Wire

☐0 No ☐1 Yes Needle
☐0 No ☐1 Yes Other_____

BREAST QUADRANT

☐1 Upper Inner ☐4 Upper Outer
☐2 Lower Inner ☐5 Lower Outer
☐3 Central ☐9 Unknown

GROSS FINDINGS

☐1 No lesion
☐2 Cyst(s) ☐1 Solitary ☐2 Multiple
☐3 Mass(es) ☐1 Solitary ☐2 Multiple
Size of Largest Mass/Cyst ___ . ___ cm
☐7 Other_____
☐9 Unknown

MAMMARY EPITHELIAL TISSUE BIOPSY

☐0 No
☐1 Yes

MICROSCOPIC FINDINGS

SIMPLE APOCRINE METAPLASIA

PRESENT	FOCI	CALCIFICATIONS
☐0 No	☐1 1	☐0 Nc
☐1 Yes	☐2 2-5	☐1 Yes
	☐3 6+	

CYSTS

PRESENT	FOCI	CALCIFICATIONS
☐0 No	☐1 1	☐0 No

PERIDUCTAL MASTITIS/DUCT ECTASIA

PRESENT	CALCIFICATIONS
☐ 0 No	☐ 0 No
☐ 1 Yes	☐ 1 Yes

MASTITIS

PRESENT

☐ 0 No

☐ 1 Yes

FIBROSIS

PRESENT	CALCIFICATIONS
☐ 0 No	☐ 0 No
☐ 1 Yes	☐ 1 Yes

SQUAMOUS METAPLASIA

PRESENT	FOCI
☐ 0 No	☐ 1 1
☐ 1 Yes	☐ 2 2-5
	☐ 3 6+

FIBROADENOMA

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5		☐ 1 Yes	
	☐ 3 6+			

Associated Findings Within Lesion

HYPERPLASIA	ADENOSIS	ADH	ALH	DCIS	LCIS	CYSTIC CHANGES
☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No
☐ 1 Mild	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes
☐ 2 Moderate/Florid						

PLACE LABEL HERE

CELLULAR STROMA

☐ 0 No

☐ 1 Yes

SIMPLE ADENOSIS

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐0 No	☐1 1	☐1 ≤ 0.3 cm	☐0 No	_____
☐1 Mild	☐2 2-5	☐2 0.3 - 0.9 cm	☐1 Yes	
☐2 Moderate/Florid	☐3 6+	☐3 1.0 - 1.9 cm		
		☐4 ≥ 2.0 cm		

Associated Findings Within Lesion

ADH	ALH	DCIS	LCIS
☐0 No	☐0 No	☐0 No	☐0 No
☐1 Yes	☐1 Yes	☐1 Yes	☐1 Yes

SCLEROSING ADENOSIS

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐0 No	☐1 1	☐1 ≤ 0.3 cm	☐0 No	_____
☐1 Mild	☐2 2-5	☐2 0.3 - 0.9 cm	☐1 Yes	
☐2 Moderate/Florid	☐3 6+	☐3 1.0 - 1.9 cm		
		☐4 ≥ 2.0 cm		

Associated Findings Within Lesion

ADH	ALH	DCIS	LCIS
☐0 No	☐0 No	☐0 No	☐0 No
☐1 Yes	☐1 Yes	☐1 Yes	☐1 Yes

APOCRINE ADENOSIS

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐0 No	☐1 1	☐1 ≤ 0.3 cm	☐0 No	_____
☐1 Mild	☐2 2-5	☐2 0.3 - 0.9 cm	☐1 Yes	
☐2 Moderate/Florid	☐3 6+	☐3 1.0 - 1.9 cm		
		☐4 ≥ 2.0 cm		

Associated Findings Within Lesion

ADH	ALH	DCIS	LCIS
☐0 No	☐0 No	☐0 No	☐0 No
☐1 Yes	☐1 Yes	☐1 Yes	☐1 Yes

PLACE LABEL HERE

HYPERPLASIA WITHOUT ATYPIA (USUAL TYPE)

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	☐ 1 ≤ 0.3 cm	☐ 0 Nc	_____
☐ 1 Mild	☐ 2 2-5	☐ 2 0.3 - 0.9 cm	☐ 1 Yes	
☐ 2 Moderate/Florid	☐ 3 6+	☐ 3 1.0 - 1.9 cm		
		☐ 4 ≥ 2.0 cm		

HYPERPLASIA WITHOUT ATYPIA (APOCRINE TYPE)

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	☐ 1 ≤ 0.3 cm	☐ 0 No	_____
☐ 1 Mild	☐ 2 2-5	☐ 2 0.3 - 0.9 cm	☐ 1 Yes	
☐ 2 Moderate/Florid	☐ 3 6+	☐ 3 1.0 - 1.9 cm		
		☐ 4 ≥ 2.0 cm		

ADH*

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5		☐ 1 Yes	
	☐ 3 6+			

ALH*

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5		☐ 1 Yes	
	☐ 3 6+			

PAPILLOMA

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5		☐ 1 Yes	
	☐ 3 6+			

Associated Findings Within Lesion

HYPERPLASIA	ADENOSIS	ADH	ALH	DCIS	LCIS
☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No
☐ 1 Mild	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes
☐ 2 Moderate/Florid					

PLACE LABEL HERE

RADIAL SCAR

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5		☐ 1 Yes	
	☐ 3 6+			

Associated Findings Within Lesion

HYPERPLASIA	ADENOSIS	ADH	ALH	DCIS	LCIS
☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No
☐ 1 Mild	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes
☐ 2 Moderate/Florid					

LCIS*

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5		☐ 1 Yes	
	☐ 3 6+			

DCIS*

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5		☐ 1 Yes	
	☐ 3 6+			

INVASIVE CARCINOMA

PRESENT	FOCI	SIZE	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	_____
☐ 1 Yes	☐ 2 2-5		
	☐ 3 6+		

PLACE LABEL HERE

LYMPHOCYTIC INFILTRATE

PRESENT	FOCI	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5	☐ 1 Yes	
	☐ 3 6+		

Associated Findings With Lesion

NORMAL LOBULES	DUCT ECTASIA	DCIS	CYST(S)	OTHER _____
☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No
☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes

PHYLLODES TUMOR

PRESENT	CELLULAR STROMA	STROMAL OVERGROWTH	SIZE	MITOSIS
☐ 0 No	☐ 0 No	☐ 0 No	___ ___ . ___ cm	_____ Count / 10 HPF
☐ 1 Yes	☐ 1 Yes	☐ 1 Yes		

HYPERPLASIA	MARGINS	TUMOR TYPE
☐ 0 No	☐ 0 Negative	☐ 1 Benign
☐ 1 Mild	☐ 1 Positive	☐ 2 Indeterminate
☐ 2 Moderate/Florid	Distance: ___ . ___ cm	☐ 3 Malignant

OTHER (please specify) _____

PRESENT	FOCI	SIZE	CALCIFICATIONS	BLOCK
☐ 0 No	☐ 1 1	___ . ___ cm	☐ 0 No	_____
☐ 1 Yes	☐ 2 2-5	☐ 99 N/A	☐ 1 Yes	
	☐ 3 6+			

Associated Findings Within Lesion

HYPERPLASIA	ADENOSIS	ADH	ALH	DCIS	LCIS
☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No	☐ 0 No
☐ 1 Mild	☐ 1 Yes	☐ Yes	☐ 1 Yes	☐ 1 Yes	☐ 1 Yes
☐ 2 Moderate/Florid					

*ADH: Atypical Ductal Hyperplasia
ALH: Atypical Lobular Hyperplasia
LCIS: Lobular Carcinoma In Situ
DCIS: Ductal Carcinoma In Situ

PLACE LABEL HERE

BENIGN BREAST DISEASE STUDY

LOCATOR FORM

All study subjects have been mailed an introductory letter briefly explaining the study. As an interviewer, you will be calling subjects to administer a short health survey. All numbered survey questions should be read. Instructions and survey codes are enclosed in [ ].

INTRODUCTION:

"Hello may I speak with **[Subject]**? Hello, my name is **[Interviewer]** and I am calling from a women's health study being conducted by Henry Ford Health System. We recently sent a letter telling you about our study looking at the prevention of disease among women. As a woman who at some time has received medical care at Henry Ford, I would like to ask you some questions about your health. All information you provide will be strictly confidential. This will only take a few minutes."

[IF SUBJECT IS DECEASED OR UNABLE TO ANSWER THE QUESTIONS: Explain study to contact person and ask them if they will complete Locator Form questions #5 and 7 as it relates to the study subject. State that we may need to contact them for additional information about the subject. Ask the contact person for their name, address and phone number and record on the corrected side of the Data Sheet. Record who completed the form on page 6.]

[IF SUBJECT DID NOT RECEIVE THE LETTER: Paraphrase the letter to the subject. If they would like another copy of the letter sent to them, verify their name and address and inform them you will be calling back after the letter is mailed.]

1. On average, how often do you see your primary care physician? **[Read 1-4]** _____

    1. More than once a year
    2. Once a year
    3. Once every 2-3 years
    4. Less than every 4 years
    9. Don't Know

2. On average, how often do you receive a mammogram? **[Read 1-4]** _____

    1. More than once a year
    2. Once a year
    3. Once every 2-3 years
    4. Less than every 4 years
    9. Don't Know

3. On average, how often do you have a pap smear? [Read 1-4] _____

1. More than once a year
2. Once a year
3. Once every 2-3 years
4. Less than every 4 years
9. Don't Know

4. Have you ever been diagnosed with ovarian cysts? [0=No, 1=Yes, 9=DK] _____

5A. Have you ever had any type of breast procedure, such as a needle biopsy or a lump or cyst removed?

[0=No (Skip to 6A), 1=Yes, 9=DK] _____

5B. Can you tell me when you had your most recent breast procedure? _____ OR _____
Month/Year Age at Surgery

5C. At the time of this procedure, when you were not feeling well, say with a sore throat or other general illness, did you go to a primary care doctor at Henry Ford?

[0=No, 1=Yes, 9=DK] _____

6A. Have you ever had any <u>other</u> type of medical procedure where tissue, such as skin or a polyp, was removed?

[0=No (Skip to 7A), 1=Yes, 9=DK] _____

6B. Can you tell me what your most recent procedure was? _____

6C. And when did you have this procedure? _____ OR _____
Month/Year Age at Procedure

6D. Can you tell me the name and location of the medical facility or hospital where you had this procedure?

Name	City	State

7A. Have you ever been diagnosed with breast cancer?

[0=No (Skip to NO section below), 1=Yes, 9=DK] _____

7B. When were you diagnosed with breast cancer? _____ OR _____
Month/Year Age at Diagnosis

brcahfh [0=no, 1=Yes, 9=DK] _____

7C. Can you tell me the name and location of the medical facility or hospital where you were diagnosed?

Name	City	State

IF YES TO #7A:

"We are especially interested in learning more about breast cancer. We would like to contact you again to ask you some additional questions about your health. For that reason, I would like to take a minute to confirm location information with you. "

IF NO TO #7A:

"We are very interested in the prevention of disease among women. We may be contacting you again to ask you some additional questions about your health. For that reason, I would like to take a minute to confirm location information with you."

GO TO PRE-PRINTED DATA SHEET TO CONFIRM INFORMATION

8. If you have a vacation home or other residence, could you tell me the address, telephone number and time of year you are at that residence?

[0=No Other Residence (Skip to 9), 1=Yes] _____

Street Address _____

City, State, Zip Code and Country _____

Phone (___ ___ ___) ___ ___ ___-___ ___ ___ ___

Time at Residence From (M/D): _____ / _____ To (M/D): _____ / _____

9. Can you tell me the names of two adults who live with you and what their relationship is to you?

[0=No/Lives Alone, 1=Yes, 2=Unwilling to State] _____

1. First and Last Name _____ Relationship_____

2. First and Last Name _____ Relationship_____

10. What is the name, address and telephone number of your current primary care physician or clinic?

[0=No Primary Care Physician, 1=Yes, 2=Unwilling to State] _____

Name of physician or clinic _____

Street Address _____

City, State, and Zip Code _____ _____

Phone (___ ___ ___) ___ ___ ___-___ ___ ___ ___

11. It would be great help to us if you could provide us with the names and addresses of two people who you do not live with that could give us your new address should you move. We would only contact these people if we were unable to reach you at your home address.

[0=No One Available, 1=Yes, 2=Unwilling to State] _____

1. Name of Contact _____

   Street Address _____

   City, State, and Zip Code _____ _____

   Phone (___ ___ ___) ___ ___ ___-___ ___ ___ ___

   Relationship _____

2. Name of Contact _____

   Street Address _____

   City, State, and Zip Code _____ _____

   Phone (___ ___ ___) ___ ___ ___-___ ___ ___ ___

   Relationship _____

CLOSING:

"That all the information that I need today. Thank you for taking the time to respond to these questions. Your cooperation in this women's health study is greatly appreciated. "

Go to Page 6 to complete Interviewer Assessment

END OF INTERVIEW

INTERVIEW ASSESSMENT

Complete the following items after finalizing the interview.

1. Record subject's status. _____

    1. Alive, living in own or relative's home
    2. Alive, living in nursing home/residential care facility
    4. Deceased
    7. Other (specify) _____

2. Record who completed the Locator Form. _____

    1. Subject
    2. Spouse
    3. Offspring
    7. Other (specify relationship) _____

3. If Locator Form was not completed by subject, record why.

    [Skip if subject completed form or is deceased.] _____

    1. Physical illness or confinement
    2. Mental instability
    3. Difficulty understanding or speaking English
    4. Poor hearing or speech
    7. Other (specify) _____
    8. Not Applicable
    9. Don't Know

4. Record your perception of the subject's willingness to be contacted in the future. _____

    1. Willing
    2. Not willing
    7. Other (specify) _____
    9. Don't Know

5. Record any additional comments relevant to the interview:

_____

_____

_____

BENIGN BREAST DISEASE STUDY

MEDICAL RECORD ABSTRACT

MRN ___ ___ ___ ___ ___ ___ ___ ___ ___

Follow-up Complete Yes No

Index Date ___ ___ / ___ ___ / ___ ___

Abstractor Status:
1. Complete/Finalized
2. Incomplete/Finalized
3. Chart Not Received

Date Abstracted ___ ___ / ___ ___ / ___ ___ ___ ___

Abstractor's Initials ___ ___ ___

DEMOGRAPHICS at time of chart abstraction:

1. Name: _____ [last] _____ [first] _____ [mi]

2. Social Security Number: ___ ___ ___ - ___ ___ - ___ ___ ___ ___

3. Date of Birth: ___ ___ / ___ ___ / ___ ___ ___ ___

4. Sex:
1=Female
2=Male

5. Race:
1=White/Caucasian
2=Black/Afrian American
3=Hispanic/Latino
4=Asian/Pacific Islander
5=Middle Eastern
6=Native American/American Indian
7=Other, specify_____
9=Unknown

6. Current Marital Status:
1=Divorced
2=Married
3=Single
4=Widowed
5=Legally separated
9=Unknown

7. Spouse's Name, if applicable: _____

8. Maiden Name: _____

9. Former Last Name: _____

10. Vital Status:
0=Deceased
1=Alive

11. Date of Vital Status Assessment: __ __ / __ __ / __ __ __ __

12. Insurance at Index Date:
1=HAP
2=Other HMO
3=Blue Cross/Blue Shield
4=Medicare
5=Medicaid
6=Other _____
7=None
9=Unknown
Date documented: __ __ / __ __ / __ __ __ __

13. Previous Insurance:
(w/in 10 yrs prior to index)
1=HAP
2=Other HMO
3=Blue Cross/Blue Shield
4=Medicare
5=Medicaid
6=Other _____
7=None
9=Unknown
Date documented: __ __ / __ __ / __ __ __ __

14. Highest Education:
1=Grade School (< 8 years)
2=Some High School (8 – 11 years)
3=Completed High School/GED
4=Vocational School
5=Some College
6=Completed College
7=Post-graduate School
9=Unknown

MEDICAL HISTORY

1. Hormonal Contraceptive Use **from beginning of chart up to index date:**

0=No
1=Yes
9=Unknown

Start date of use: __ __ / __ __ / __ __ __ __

Length of time (years): _____

Type:
1=Birth Control Pills
2=Shots or Injections
3=Subdermal Implants

Start date of use: __ __ / __ __ / __ __ __ __

Length of time (years): _____

Type:
1=Birth Control Pills
2=Shots or Injections
3=Subdermal Implants

2. Hormone Replacement Therapy Use **from beginning up to index date:**

0=No
1=Yes
9=Unknown

Date mentioned in chart: __ __ / __ __ / __ __ __ __

Start date: __ __ / __ __ / __ __ __ __

Stop date: __ __ / __ __ / __ __ __ __

Type:
1=Estrogen Alone
2=Estrogen plus Progesterone
3=Progesterone Alone

Date mentioned in chart: __ __ / __ __ / __ __ __ __

Start date: __ __ / __ __ / __ __ __ __

Stop date: __ __ / __ __ / __ __ __ __

Type:
1=Estrogen Alone
2=Estrogen plus Progesterone
3=Progesterone Alone

3. Other Medical Conditions diagnosed/mentioned **up to 10 years prior to index date:**

0=No
1=Yes
9=Unknown

Allergies:
____ Drug allergy
____ Food allergy
____ Hay fever
____ Other allergies

____ Anemia or other blood disorder
____ Arthritis (Non-inflammatory)
____ Arthritis (Rheumatoid)

Cardiovascular Diseases:
____ Heart disease
____ Hypertension (high blood pressure)

Cerebrovascular Diseases:
____ Stroke
____ Transient Ischemic Attack (TIA)

____ Diabetes ('sugar')
____ Folate deficiency
____ Hyperthyroid disease
____ Hypoglycemia
____ Hypothyroid disease
____ Immune system disorder

Infectious Diseases:
____ Chicken pox
____ Encephalitis
____ Herpes simplex
____ Measles
____ Meningitis
____ Mononucleosis (mono)
____ Mumps
____ Pneumonia

Infectious Diseases (cont.):
____ Poliomyelitis (polio)
____ Shingles zoster
____ Toxoplasmosis
____ Tuberculosis (TB)
____ Typhoid

____ Kidney disease
____ Liver disease

Neurologic/Psychiatric Disorders:
____ Clinical depression
____ Epilepsy/Seizures/Convulsions
____ Migraine headaches
____ Multiple Sclerosis (MS)
____ Psychiatric conditions requiring medication

____ Parathyroid disease
____ Pituitary disease

Respiratory Diseases:
____ Asthma
____ Emphysema
____ Other respiratory disease

____ Stomach or other digestive disorder
____ Vitamin B1 Deficiency
____ Vitamin B12 Deficiency

____ **Other Medical Conditions (specify):**

_____

_____

4. Mammography History **from beginning up to one year after index date:**

0=No
1=Yes
9=Unknown

Dates:	Results:	Result Codes:
__/__/_____	_____	1=Negative 2=Benign/Negative 3=Probably Benign 4=Suspicious 5=Highly Suspicious 8=Incomplete/Inconclusive 9=Unknown
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	

5. Breast Biopsy History from beginning **up to one year after index date:**

0=No
1=Yes
9=Unknown

Dates:	Results:	Result Codes:
__/__/_____	_____	1= Benign Breast Disease (BBD) 2= Ductal or Lobular Carcinoma In Situ (DCIS or LCIS) 3= Cancer (Carcinoma) 4= Both BBD and CIS/Cancer 5= Lumpectomy or Mastectomy (unilateral or bilateral) 6= Cosmetic Breast Reduction or Enlargement 7= Other Breast Biopsy (non-mammary epithelial biopsy of skin, nipple, fat, axillary lymph nodes, etc.) 8= Incomplete/Inconclusive 9=Unknown
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	
__/__/_____	_____	

BODY SIZE INFORMATION

1. Maximum Height (inches): _____ Date: __ __ / __ __ / __ __ __ __

2. Weight closest to **index date** (pounds): _____ Date: __ __ / __ __ / __ __ __ __

3. Weight during previous decade (pounds): _____ Date: __ __ / __ __ / __ __ __ __

4. Weight during previous decade (pounds): _____ Date: __ __ / __ __ / __ __ __ __

5. Weight during previous decade (pounds): _____ Date: __ __ / __ __ / __ __ __ __

REPRODUCTIVE HISTORY from beginning of chart up to index date:

1. Age at Menarche (years): _____ [99=Unknown]

2. Age at First Birth (years): _____ [88=No Children; 99=Unknown]

3. Number of Pregnancies up to **index date**: _____ [99=Unknown]

4. Total Number of Pregnancies (gravida): _____ [99=Unknown]

5. Total Number of Births (para): _____ [99=Unknown]

6. Menopausal Status at **index date**:
   1=Pre-menopausal
   2=Peri-menopausal
   3=Post-menopausal
   9=Unknown

7. Year of Menopause: __ __ __ __
   (skip if not post-menopausal)

8. Hysterectomy:
   0=No
   1=Yes
   9=Unknown

   Number of ovaries removed: _____

   Date of surgery: __ __ / __ __ / __ __ __ __

Index Date ___ / ___ / _____

CANCER HISTORY

1. Subject's History of Primary Cancer **from beginning of chart up to index date:**

0=No
1=Yes
9=Unknown

		Yes/No:	Date of Dx:
A.	Breast	_____	___/___/_____
B.	Endometrial	_____	___/___/_____
C.	Colorectal	_____	___/___/_____
D.	Ovarian	_____	___/___/_____
E.	Cervical	_____	___/___/_____
F.	Other: site: _____ code: _____	_____	___/___/_____
	site: _____ code: _____	_____	___/___/_____

2. Family History of Cancer **from beginning of chart up to index date:**

0=No
1=Yes
9=Unknown

	Relative:	Rel. Code:	Cancer:	Cancer Code:	Age at Dx:
A.	_____	_____	_____	_____	_____
B.	_____	_____	_____	_____	_____
C.	_____	_____	_____	_____	_____
D.	_____	_____	_____	_____	_____
E.	_____	_____	_____	_____	_____
F.	_____	_____	_____	_____	_____
G.	_____	_____	_____	_____	_____
H.	_____	_____	_____	_____	_____

LIFESTYLE HISTORY

1. Smoking Status **starting with beginning of chart up to index date:**

0=No
1=Yes
9=Unknown

Date	Status: 1=Current Smoker 2=Past Smoker 3=Never Smoker	Packs/Day*	# of Years at this Packs/Day	If **Past Smoker,** Calendar Year Quit
___/___/_____				
___/___/_____				
___/___/_____				

*Cigarettes/day	Packs/day
1 – 5	0.25
6 – 10	0.50
11 – 15	0.75
16 – 20	1.0

2. Occupational History **within 10 years of index date:**

0=No
1=Yes
9=Unknown

Date	Name of Occupation	Years in Occupation
___/___/_____		
___/___/_____		
___/___/_____		

IF INCOMPLETE FOLLOW-UP:

1. Telephone numbers: Home: (___) _____ Work: (___) _____

   Emergency: (___) _____

2. Current address: Street Address _____

   City, State, Zip Code _____

3. Address **at index date**, if different: _____ Date: ___/___/_____

   _____

4. Previous address, if different: _____ Date: ___/___/_____

   _____

5. Spouse's employer: Name _____ Phone #: (___) _____

   City, State _____

6. Name and address of next-of-kin: _____

   _____

   _____

   Relationship:
   1. Current spouse
   2. Former spouse
   3. Offspring
   4. Parent
   5. Sibling
   6. Other, specify _____

7. Date of last physician visit or hospital admission: ___/___/_____

8. Name of primary care physician: _____

9. Location of primary care physician: _____

APPENDIX C

Selected Abstracts and Manuscripts

of treatment and follow-up data. Data was obtained in close to 100% of the patients, and an interactive Internet website was created for survival analysis. Any combination of prognostic factors can be chosen, and a survival curve for the selected patient group is computed online. Most of the prognostic variables were strongly associated with outcome even when determined nation-wide. Groups with variable outcome could be identified within a single stage. For example, women with screen-detected pT1N0M0 grade 1 cancer (n=116) had 100% 5-yr disease-free survival (DFS), whereas those with pT1N0M0 cancer found outside screening had 96% (n=150) and 84% (n=284) 5-yr DFS for histological grade 1 and grade 2-3 cancers, respectively. A survival curve could be created with any factor combination within a few seconds using the interactive web site. We plan to apply regression models and artificial neural networks and expand the data set with novel biological prognostic factors.

#598 HISTOPATHOLOGIC PREDICTORS OF SURVIVAL IN EARLY STAGE, INVASIVE BREAST CANCERS AMONG US AND EUROPEAN POST-MENOPAUSAL WOMEN. Aaron Thomas Fleischauer, N. Simonsen, S. London, J. Strain, J. Schilling, and L. Arab, *National Institute of Environmental Health Sci, RTP, RTP, NC, Univ of North Carolina, Chapel Hill, NC, Univ of Ulster, Coleraine, Ireland, and Univ of Zurich, Zurich, Switzerland*

Tumor histopathologic characteristics were evaluated and modeled as predictors of five-year survival among postmenopausal women with early stage invasive breast cancer, utilizing and comparing both European and US derived cohorts. Archived tumor tissue samples were collected from postmenopausal women (median age at diagnosis = 63) previously enrolled into case-control studies in Europe (EURAMIC study, N=98) and Boston (N=108). No significant differences in tumor cell type or five-year all-cause mortality were observed between the Boston and European women (15.7% and 14.6% mortality, respectively). Among both cohorts, the degree of pleomorphism, mitotic fraction, nuclear grade and histologic grade were predictors of five-year survival. Specifically, Boston women exhibited a relative risk of mortality for mitotic rate (>10hpf) of 3.6 (95% CI = 1.0 – 12.2), 2.0 (95% CI = 0.9 – 5.1) for marked pleomorphy, and 2.6 (95% CI = 0.7 – 10.4) for histologic grade III. Similarly, European women exhibited a relative risk of mortality for mitotic rate (>10hpf) of 5.3 (95% CI = 1.4 – 20.5), 3.0 (95% CI = 1.2 – 7.7) for marked pleomorphy, and 5.0 (95% CI = 1.2 – 19.9) for histologic grade III. Degree of differentiation was a weak predictor in both groups. Histologic features of primary, early stage breast cancer are strong predictors of five-year survival in both the US and European postmenopausal cohorts. Mitotic rate and histologic grade demonstrated the greatest prognostic value. While some histologic features, such as histologic grade, appeared to predict survival more strongly among European women, there were no statistically significant differences in predictors between the two cohorts.

#599 PROGNOSTIC FACTORS FOR NODE-NEGATIVE BREAST CANCER: ALL SUBSETS ANALYSES FOR FACTOR EFFECTS. Judy- Anne W Chapman, H. L A Lickley, M. E Trudeau, W. M Hanna, H. J Kahn, D. Murray, C. A Sawka, B. G Mobbs, D. R McCready, and K. I Pritchard, *Univ of Toronto, Toronto, On, Canada*

Information was collected for a full inception cohort of 415 T1-3, M0, histologically node-negative patients, accrued 1977–86, and with 96% complete follow-up to early 1993. We used all subset Cox and log-normal regression models to investigate the effects of the following factors on recurrence outside the breast and disease-specific death: age (in years), weight (kgs), tumour size (cms), estrogen receptor (ER; fmol/mg protein), progesterone receptor (PgR; fmol/mg protein), combined ER/PgR receptor (ER-/PgR-, ER+/PgR-, ER-/PgR+, ER+/PgR+; where -/+ is defined as 10, ≥10 fmol/mg protein), histology (8 categories), nuclear and tumour grades (1,2,3), lymphovascular invasion (lvi; no,yes), IHC neu oncogene (% positive stain; 0%,>0% positive stain), DNA ploidy (diploid, aneuploid), cells in S-phase (in standardized log units), and adjuvant therapy (no, yes). Lvi was in all the best models; S-phase and IHC neu oncogene were in almost all; tumour or nuclear grade, histology, ER, PgR, or combined recptor were in many; and tumour size, adjuvant therapy, and ploidy were in some of the best models. There was evidence against the Cox assumption of proportional hazards; the log-normal models for DFS and DSS consistently indicated that the presence of lvi, more positive staining for neu oncogene and high S-phase were associated with a worse prognosis. The literature has inconsistent evidence for the importance of various prognostic factors; this is likely to increase with the simultaneous assessment of thousands of factors with microarrays. We demonstrate a more extensive analysis which assesses, within a single study, the consistency of association of factors with outcome.

#600 POLYUNSATURATED FAT INTAKE AND MORTALITY AFTER BREAST CANCER DIAGNOSIS IN POSTMENOPAUSAL WOMEN. Neal R Simonsen, Stephanie London, and Lenore Arab, *National Institute of Environmental Health Sci, RTP, NC, and UNC-Chapel Hill, Chapel Hill, NC*

Studies of polyunsaturated fatty acid (PUFA) intake and breast cancer prognosis have provided inconsistent results. To evaluate the hypothesis that mortality after diagnosis falls with increased omega-3 PUFA intake, while omega-6 polyunsaturates offset this effect, survival of 270 postmenopausal Boston women diagnosed with incident breast cancer during 1986-1988 was analyzed through 1998. Intake was determined from food frequency questionnaire data obtained at diagnosis. Mortality due to breast cancer as a primary or contributing cause was identified from death certificates. Adjusted for total fat intake, nodal status, and tumor size, increasing intake of docosahexaenoic acid (DHA), the major long-chain omega-3 PUFA, from the 25th to the 75th percentile of consumption was estimated to reduce mortality by 10% (relative risk (RR) 0.90, 95% confidence limits 0.59-1.37). In contrast, relative risk for the major omega-6 PUFA, linoleic acid, was 1.21 (0.75-1.94). No significant RR was seen for any PUFA, including arachidonic and alpha-linolenic acid. Among cases in the lowest tertile of omega-6 intake, only DHA's association with mortality approached statistical significance (RR 0.60, 0.31-1.08), and no consistent relationship was seen for this or any other polyunsaturate across omega-6 tertiles. The small number of breast cancer deaths (37) and potential misclassification due to reliance on death certificates limits the power of these analyses. That notwithstanding, while the observed associations are in the hypothesized directions, none provide statistically significant evidence linking polyunsaturate intake with breast cancer mortality.

#601 A CULTURALLY APPROPRIATE BREAST CANCER RISK FACTOR SURVEY FOR AFRICAN AMERICAN WOMEN: FOCUS GROUP RESULTS. Marvella E Ford, D Hill, J Morrison, M J Worsham, S Wolman, and C C Johnson, *Resource Ctr for Minority Aging Res and Josephine Ford Cancer Ctr, Henry Ford Health System, Detroit, MI*

Clinical decision-making algorithms and public policies are typically based on the results of research using measurement instruments. These algorithms and policies affect the manner in which health care is provided. Therefore, it is important to assess the cultural appropriateness of measurement instruments for use with specific populations. This presentation describes the results of guided focus groups held in 1998 with African American women. Focus group participants responded to items compiled from standardized surveys on breast cancer risk factors. The first focus group (n=12) was held with African American women aged 18–50 years randomly selected from the Henry Ford Health System patient population. A second focus group was held with nine randomly selected African American women aged 50+ years. A sample set of focus group questions referring to a specific table in the breast cancer risk factor survey include: (a) Are the instructions on how to fill out the table clear to you?; (b) If not, how could they be made clearer?; (c) How would you feel if you were asked to complete this table?; (c) Are the words in the table clear to you?; (d) If not, which words would you use to describe these things?; and (e) How does the layout of the table look to you? The results of the focus group revealed several categories related to the survey design. These categories include the overall content of the survey, survey questions requiring calculations or detailed remembrances of past events, privacy and confidentiality issues, and the overall experience of completing the survey. The results of this research show that breast cancer risk factor survey questions developed in the general population may not be appropriate for use with African American women.

#602 ADOLESCENT SOY FOOD INTAKE AND OTHER DIETARY HABITS AND BREAST CANCER RISK. X O Shu, F Jin, D Qi, W Q Wen, J D Potter, L H Kushi, Y T Gao, and W Zheng, *Shanghai Cancer Institute, Shanghai, China, and Univ of South Carolina, Columbia, SC*

Despite strong evidence from animal studies and *in vitro* experiments implicating potential cancer-inhibitory effects of soy and its constituents, only few epidemiological studies investigated the association between soy food intake and breast cancer risk and results have been inconclusive. To our knowledge, no study has evaluated the association of soy food intake during adolescence with the risk of breast cancer later in life. We analyzed data from the recently completed Shanghai Breast Cancer Study, a population-based case-control study of 1459 breast cancer cases and 1556 frequency matched controls. Information on dietary intake during ages 13 to 15 years was obtained by interview of all study participants and mothers of subjects under age 40 years (296 cases and 359 controls). After adjustment for traditional breast cancer risk factors, soy food intake during adolescence was inversely associated with breast cancer risk among both pre- (trend test P-value <0.001) and postmenopausal women (P=0.06). Adjusted odds ratios (95% confidence interval) were 1.0 (reference), 0.8 (0.6–0.9), 0.7 (0.6–0.9), 0.7 (0.6–0.9) and 0.5 (0.4–0.7), respectively, for the lowest to highest quintiles of soy food intake. The levels of adolescent soy food intake reported by study participants and their mothers correlated reasonably well (r=0.30). The adolescent soy food intake reported by the mothers was also inversely associated with risk of breast cancer (P<0.001). Breast cancer risk was inversely associated with increasing intake of rice and wheat products, eggs, seafoods, and milk during adolescence, but was unrelated to meat, vegetables and fruit intake, and preserved foods. Adjustment for rice and wheat products, the major energy source in the study population, did not change the soy food associations. This study is the first to report that high soy intake during adolescence, one of the periods that breast tissue is most sensitive to environmental stimuli, may reduce the risk of breast cancer in later life.

:o 4 μM BPDE in vitro, the lymphocytes were harvested for cytogenetic study. The average of simple chromatid breaks per cell (b/c) from a total of 50 metaphases per subject was used for statistical comparisons. Overall, cases had a greater mean b/c value (mean±SD, 0.53±0.22) than controls did (0.41±0.16). The difference was statistically significant (P<0.001). Using the control median b/c as the cut-off value for high and low sensitivity, high sensitivity was associated with a four-fold increased risk (Odds ratio, 4.00; 95% confidence interval, 1.61-9.97; adjusted for age and ethnicity). This preliminary finding suggests that increased sensitivity to tobacco carcinogens may play a role in the etiology of breast cancer. (Supported in part by HIH grant CA70264, CA55769, and CA70334).

#820 *WAF-1 (P21)* AND *P53* POLYMORPHISMS IN BREAST CANCER. Channa K C Keshava, B. L Frye, M. S Wolff, and A. Weston, *Mount Sinai Med Ctr, New York, NY, and Niosh,, CDC, Morgantown, WV*

Previous studies have indicated that certain *p53* polymorphisms confer an increased risk of breast cancer (ORs and 95%CIS = 2.9, 1.4 – 6.3 *Carcinogenesis* 17: 1313, 1996; 2.5, 1.3 – 4.8 *Cancer Epidermiology, Biomarkers and Prevention* 6:105, 1997; 1.5, 1.1 – 2.0, *Anticancer Research* 18: 2095, 1998). *p53* is a transcription factor for *Waf-1/p21* a cyclin-dependent kinase inhibitor, which is also polymorphic. To test the hypothesis that minor variants (F = 0.10 Caucasians, 0.27 Latinas, 0.34 African Americans) of a codon 31 polymorphism of *Waf-1* are involved in this process, genotypes were determined by PCR/RFLP for 355 women (122 cases and 233 controls) enrolled in a breast cancer case-control study. No increased breast cancer risk was associated with inheritance of minor variants of *Waf-1* (OR = 1.1, 95%CI = 0.7 – 1.6). Similarly, analysis by both race and menopausal status was unable to find any association. Finally, despite an increased risk for Caucasians associated with the *p53* genotype (*CEBP* 1997), no risk was found to be associated with *Waf-1* alleles independently or in combination with *p53* alleles (OR = 1.1, 95%CI = 0.3 – 4.7).

#821 CHARACTERISTICS OF P53, HER/*NEU* AND *BCL-2* IN A LOW RISK BREAST CANCER POPULATION OF CHINESE PATIENTS FROM MAINLAND CHINA. XiaoTan Qiao, Karen S Fiderici, Zeng Si, ChangBan Gong, GongHa Zhou, Yan Li, Lin Wang, KeFeng Dou, Kenneth S van Golen, Sofia D Merajver, and Charles D Mackenzie, *BenXi Gen Hosp, BenXi, People's Rep of China, China-Japan Friendship Hosp, BeiJing, People's Rep of China, Michigan State Univ, East Lansing, MI, Univ of Michigan, Ann Arbor, and XiJing Hosp, Xian, People's Rep of China*

Reliable epidemiological data reveal striking differences in breast cancer risk between the North American Caucasian and Chinese Asian populations. We hypothesize that these differences in risk reflect in part, different pathways of breast carcinogenesis, which may, in turn be due to epigenetic or environmental variables. To begin to test this hypothesis, we investigated a cohort of 178 patients breast cancer samples from mainland China. The tumors were analyzed for descriptional parameters such as age, stage, ER/PR status, and grade as well as molecular genetic alterations in p53, HER-2/*neu*, and Bcl-2. For p53, HER2/*neu* (*c-erbB-2*), and Bcl-2, 14.2%, 23.1% and 66.4% stained positively by immunohistochemistry. HER2/*neu* gene amplification was detected by differential polymerase chain reaction methods and 29.1% of specimens were positive. Sixty-four samples were evaluated for p53 gene point mutations in exon 5 to 9 by PCR-single strand conformation polymorphism assay, followed by gene sequence analysis: only 1/64 (1.56%) was found to be positive for a missense transition mutation at codon 151, a CpG site. The results demonstrated that the Western (high breast cancer risk group) and Chinese (low risk group) populations have similar phenotypic features and also similar proportions of genetic alterations in these 3 key molecular markers.

#822 BREAST CANCER INCIDENCE AMONG A COHORT OF WOMEN WITH BENIGN BREAST DISEASE. Angela C Blount, Usha Raju, Judith Abrams, Michelle Jankowski, S David Nathanson, Sandra R Wolman, Maria J Worsham, and Christine C Johnson, *Henry Ford Health System, Detroit, MI, Uniformed Service Univ of the Health Sci, Bethesda, MD, and Wayne State Univ, Detroit, MI*

The risk of developing breast cancer has been reported to be increased among women with a history of benign breast disease (BBD). A cohort of women diagnosed with BBD from 1981-1994 was established to investigate this relationship in a large health care system. Women were eligible for entry with an initial index BBD biopsy performed during this time period. A diagnosis of breast cancer prior, concurrent or within 6 months of the index BBD biopsy ruled women ineligible for the cohort. The archived pathology reports of all breast biopsies were retrieved and reviewed by an expert breast pathologist to identify specimens containing only BBD lesions. The slides were microscopically reviewed for confirmation of the diagnosis utilizing a universal diagnostic terminology system. All cohort members were followed from their index BBD biopsy for the subsequent occurrence of breast cancer. During cohort establishment, 5254 women were found to be eligible and 116 ineligible. Slide review revealed the lesions were primarily proliferative (65%), with 30% non-proliferative, and 4% atypical ductal or lobular hyperplastic. The cohort yielded 167 cases of breast cancer detected through July 1999. With 48,201 person-years of follow-up, the average incidence rate was 346.5 per 100,000 (95% confidence interval [CI], 295.9-400.8), ranging from 298.3 (95% CI, 148.9-534.0) in the 1981 cohort year to 530.8 in 1994 (95% CI, 254.8-976.6). In comparison to 1991-1995 SEER rates of 353.8 nationally and 363.6 per 100,000 for the metropolitan Detroit area among women aged 50 and older, breast cancer incidence in this BBD cohort does not appear to differ from the general population.

#823 EVALUATION OF PROPHYLACTIC OPTIONS FOR ASHKENAZI JEWISH WOMEN WITH A BRCA MUTATION: A DECISION ANALYSIS. Lesley-Ann Natasha Miller, and Mendel E Singer, *Case Western Reserve Univ Sch of Medicine, Cleveland, OH*

Ashkenazi Jewish women have a high prevalence (about 2.5%) of three specific BRCA1/2 mutations that are associated with an increased risk of developing breast or ovarian cancer. The authors developed a Markov decision model and used Monte Carlo simulation to evaluate the implications of various prophylactic options for a 40 year old woman who tests positive for any one of these mutations. Prophylactic options considered included prophylactic mastectomy (PM), prophylactic oophorectomy (PO), both PM and PO, tamoxifen chemoprevention, and increased screening. Parameter estimates were taken from SEER cancer statistics and the published literature. Outcomes considered were additional life expectancy and quality-adjusted life years (QALYs). We assumed that PO would reduce the risk of ovarian cancer (OC) by 46% and breast cancer (BC) by 25%, PM would reduce the risk of BC by 90%, and tamoxifen would reduce the risk of BC by 44%. Increased screening was defined as biennial mammography and clinical breast exam. We postulated that this increased screening would lead to beneficial gains associated with an earlier stage of diagnosis. The results indicate that the strategy of both PM and PO offered the greatest benefit in terms of increased life expectancy. However, after adjusting for quality of life (QOL), increased screening becomes the preferred strategy. For all surgical or chemopreventive strategies, the loss in QOL more than offset the benefit of the associated risk reduction. Time discounting of future life years had no impact on the results. QOL considerations may have a profound impact on choosing the optimal BC/OC prophylaxis.

#824 ASSOCIATION BETWEEN BREAST CANCER AND THE THREE DIFFERENT VITAMIN D RECEPTOR GENE POLYMORPHISMS TAQI, BSMI AND APAI. Diana Lueftner, M. Schweigert, K. Engellandt, P. Petrides, I. Roots, K. Possinger, and I. Cascorbi, *Humboldt Univ Berlin, Berlin, Germany*

Breast cancer (BRCA) growth is influenced by vitamin D. We investigated the distribution of the *Taq*I (T/t), *Bsm*I (B/b) and *Apa*I (A/a) VDR gene polymorphisms in 247 BRCA patients and 248 age-matched controls. After DNA extraction from white blood cells, VDR genotypes were determined by polymerase chain reaction (PCR) amplification followed by restriction enzyme digestion of the PCR product. The mean age for BRCA patients (and controls) was 60.4 (60.1) years with a range from 31–90 (31–91) years. The VDR genotype distribution for BRCA patients (in comparison to controls) was as follows: BB: 17.8% (17.3%); Bb: 46.6% (48%); bb: 35.6% (34.7%); AA: 26.7% (26.6%); Aa: 49.8% (53.6%); aa: 23.5% (19.8%); TT: 37.7% (39.1%); Tt: 47.4% (51.6%); tt: 15.0% (9.3%). The VDR genotype distribution was statistically not different between BRCA patients and controls for the *Bsm*I and *Apa*I genotypes. However, for *Taq*I an increase of the genotypes TT + Tt vs. tt could be found (odds ratio: 1.72; CI: 0.99–2.99, p=0.052). Combined analysis adjusted for age and considering all genotypes revealed a relative risk of TT vs. tt of 3.02 (CI: 1.19-7.71, p=0.02) to develop breast cancer. This finding is important for the screening of risk families and for replacement therapy in hospitalized patients who generally show a decreased vitamin D level.

CELL AND TUMOR BIOLOGY 6: Proteases I

#825 RAPID TRAFFICKING OF MT1-MMP TO THE CANCER CELL SURFACE FROM A POST-GOLGI STORAGE POOL RESULTS IN EXPLOSIVE CELL SURFACE ACTIVATION OF LATENT MMP-2. Stanley Zucker, Michelle H Hymowitz, Cathleen E Conner, and Jian Cao, *SUNY - Stony Brook, Stony Brook, NY, and VA Med Ctr, Northport, NY*

Pericellular matrix degradation during cancer invasion is dependent on activation of proMMP-2 by Membrane Type 1-Matrix Metalloproteinase (MT1-MMP). We herein report that concanavalin A (con A) or phorbol (PMA) treatment of HT-1080 fibrosarcoma cells is followed by MT1-MMP induced activation of proMMP-2 on the cell surface within 30 min. Surface biotinylation, immunoprecipitation, and ^{125}I-TIMP-2 binding techniques were employed to characterize MT1-MMP appearance on the cell surface. Con A-induced trafficking of MT1-MMP from a post-Golgi compartment (endosomal/secretory) to the cell surface occurred within 10 min. Rapid MT1-MMP trafficking was accelerated by brefeldin A, a Golgi inhibitor and chloroquine, a lysosome inhibitor; cycloheximide, a protein synthesis inhibitor, had minimal early effect. Rechallenge of HT-1080 cells with con A 3 hr later demonstrated a requirement for new protein synthesis and transit through the Golgi (inhibited by cycloheximide/brefeldin A). Con A enhancement of MT1-MMP mRNA synthesis was not noted before 18 hr. After binding to cell surface MT1-MMP, ^{125}I-TIMP-2 is internalized and secreted as an intact protein after 3 hr. These results are consistent with an intracellular recycled storage pool for MT1-MMP which is readily available to invasive cancer cells.

PhIP. In carcinogenicity experiments with rodents, PhIP induced mammary tumors. We conducted a case-control study within the cohort of the Iowa Women s Health Study to investigate the potential role of HCAs and the risk of breast cancer. A questionnaire was mailed to women in the cohort who had breast cancer diagnosed during the period from 1992 to 1994 and a random sample of cancer-free cohort members to obtain information on usual intake of meats and cooking practices. Color photographs showing various levels of doneness for hamburger, beefsteak, and bacon were included. Using an HCA database, dietary intakes of MeIQx, DiMeIQx and PhIP were estimated. Multivariate analysis was performed on data from 273 cases and 657 control subjects who completed the survey. The odds ratios (95% confidence interval) for categorical analysis of PhIP, with the 1st quintile as the referent group, were: 2nd quintile 1.1 (0.6-1.8); 3rd quintile 1.2 (0.7-1.9); 4th quintile 1.4 (0.8-2.3); and 5th quintile 1.9 (1.1-3.4), p-value for trend 0.001. There was no statistically significant increase in risk with either MeIQx or DiMeIQx. Consumption of PhIP may play an important role in the risk of breast cancer.

#5113 SULFOTRANSFERASE 1A1 (*SULT1A1*) POLYMORPHISM, ENDOGENOUS ESTROGEN EXPOSURE, WELL-DONE MEAT INTAKE, AND BREAST CANCER RISK. W Zheng, D W Xie, Z L Deng, J R Cerhan, T A Sellers, W Q Wen, and A R Folsom, *Univ of South Carolina, Columbia, SC, and University of Minnesota, Minneapolis*

Phenol sulfotransferase 1A1 (SULT1A1) is involved in the inactivation of estrogens and bioactivation of heterocyclic amines. A G→A transition at codon 213 (CGC/Arg to CAC/His) of the *SULT1A1* gene was reported recently, and individuals homozygous for the *His* allele have a substantially lower activity of this enzyme than those with other genotypes. We hypothesized that the *His* allele may be a risk factor for breast cancer, particularly among women who had risk factors related to higher endogenous estrogen exposure. This hypothesis was investigated in a case-control study conducted in a cohort of postmenopausal Iowa women who completed, in 1986, a mailed questionnaire on lifestyle factors including information on major breast cancer risk factors. DNA samples and information related to well-done meat intake were obtained from breast cancer cases diagnosed during 1992 to 1994 and a random sample of cancer-free cohort members. Multivariate analysis was performed on data from 156 cases and 332 controls who donated a blood sample. The frequency of the *His* allele was 41.6% in cases and 34.1% in controls ($p = 0.02$), and the risk of breast cancer was increased with the number of the *His* allele (p for trend, $p = 0.02$). Compared to women with the *Arg/Arg* genotype, an 80% elevated risk was observed among women homozygous for the *His* allele (95%(CI =1.0–3.2, p=0.04). This positive association was more pronounced among women who drank alcohol and had high body mass index and late age at menopause, factors related to high endogenous estrogen exposure, than those who did not have these risk factors. In contrast, the risk of breast cancer was elevated in a dose-response manner with increasing doneness level of meat intake among women with the *Arg/Arg* or *Arg/His* genotype, while this association was not evident for women with the *His/His* genotype. The results from this study suggest that homozygosity for the *SULT1A1 His*^{213} allele polymorphism may be a risk factor for breast cancer, and its effect may depend on the exposure level of endogenous estrogens and heterocyclic amines.

#5114 ASSOCIATION OF NAT2, GSTM1, GSTP1, GSTT1, FLAME-BROILED FOOD AND THE RISK OF BREAST CANCER:A NESTED CASE-CONTROL STUDY. Kala Visvanathan, Paul Strickland, Doug A Bell, Maria A Watson, Nathaniel Rothman, Sandy Hoffman, and Kathy J Helzlsouer, *Johns Hopkins Sch of Hygiene & Public Health, Baltimore, MD, National Cancer Inst, Bethesda, MD, and NIEHS, RTP, NC*

Heterocyclic amines (HCA) are pro-carcinogens that are produced when meat is cooked in direct heat for long durations. N-Acetyltransferases (NAT2) are involved in the activation of HCA. It was hypothesized that women who consumed flame-broiled foods and were rapid acetylators of NAT2 may be at increased risk of breast cancer. The association between NAT2, flame-broiled meat intake and the risk of breast cancer was assessed in a nested case-control study. Genotype information was available for 110 cases and 113 matched controls. 86% of these cases and 89% of these controls also had information on the intake of flame-broiled food in the previous month. The risk of breast cancer was increased among women who ate flame-broiled food greater than two times a month compared to those who did not (OR = 2.03 95%CI 0.88, 4.68). This risk was further increased among women who were either homozygous or heterozygous for the rapid acetylator allele of NAT2 and ate flame-broiled food (OR= 3.43 95%CI 1.14,10.35; P trend = 0.021.) Glutathione S-transferases may be involved in the detoxification of these carcinogens. Women who had the null genotype for GSTM1 or GSTT1 or who had the Ile/Val or Val/Val genotype of GSTP1 and ate flame-broiled food were also at an increased risk of breast cancer. When the four genotypes were assessed in combination, the reference group being all low risk genotypes, the risk of breast cancer increased as the burden of high risk genotypes increased only among women who ate flame-broiled food (P trend = .001). NAT2, GSTM1, GSTT1 and GSTP1 independently and in combination seemed to significantly increase the risk of breast cancer among women who ate flame-broiled food.

#5115 GLUTATHIONE *S*-TRANSFERASE P1 POLYMORPHISM IS ASSOCIATED WITH SURVIVAL AMONG WOMEN TREATED FOR BREAST CANCER. Carol Sweeney, Gail Y McClure, Manal Y Fares, Patricia A Thompson, Angie Stone, Brian F Coles, Soheila Korourian, Laura F Hutchins, Fred F Kadlubar, and Christine B Ambrosone, *M D Anderson Cancer Ctr, Houston, TX, National Ctr for Toxicological Res, Jefferson, AR, and Univ of Arkansas for Med Sci, Little Rock, AR*

Individual variability in metabolism of therapeutic agents may affect cancer treatment response and survival. Glutathione S-transferases (GSTs) detoxify chemotherapy agents and reactive oxidant molecules produced during radiation therapy. A GST P1 polymorphism (exon 5 A-G) results in an amino acid substitution (Ile^{105}Val) affecting catalytic efficiency of the enzyme, and may affect response to cancer therapy. We evaluated survival according to germline GST P1 genotype among women with breast cancer treated by chemotherapy or radiation therapy. DNA was extracted from normal tissue (normal lymph node or skin) from paraffin blocks from women with stage 1-4 breast cancer diagnosed 1984 to 1996. PCR and RFLP were used to detect the GST P1 exon 5 A-G substitution. Vital status was determined from cancer registry follow-up. The distribution of GST P1 genotypes among 240 cases was 46.3% Ile/Ile, 44.2% Ile/Val, and 9.6% Val/Val. GST P1 genotype was associated with survival; compared to women with Ile/Ile genotype, there was a trend (p=0.04) of better survival with increased number of GST P1 Val alleles. Hazard ratios (adjusted for stage and age) were 0.8 (95% confidence interval (CI) 0.5-1.4) for Ile/Val, and 0.3 (95% CI 0.1-1.0) for Val/Val. GST P1 genotype was not associated with age, stage at diagnosis, estrogen or progesterone receptor status, positive nodes, or menopausal status. GST P1 expression in tumor cells has been associated with poor survival and with drug resistance *in vitro*, however few studies have addressed genotype and survival. Our results indicate that women with one or two inherited alleles for the GST P1 Val variant may have better outcomes of chemotherapy or radiation treatment for breast cancer than women with GST P1 Ile/Ile.

#5116 THE GENOTYPES OF THE 5α-REDUCTASE GENE ARE RELATED WITH PSA EXPRESSION AND RISK IN SPORADIC BREAST CANCER. Andreas Scorieas, B. Bharaj, B. Hoffman, M. Giai, and E. P Diamandis, *Mount Sinai Hosp, Toronto, ON, Canada, Univ of Toronto, Toronto, ON, Canada, and Univ of Turin, Turin, Italy*

5-alpha-reductase (SRD5A2), an enzyme that is expressed in androgen dependent tissues, catalyzes the reduction of testosterone (TT) to its more bioactive form, dihydrotestosterone (DHT), which in turn transactivates a number of genes. The SRD5A2 gene harbours two frequent polymorphic sites, one in the coding region at codon 89 of exon 1, where valine is substituted by leucine (V89L) and the other in the 3′ untranslated region (3′ UTR), where a variable number of dinucleotide TA repeat lengths exists. Both polymorphisms are known to alter the activity of this enzyme. We examined 151 sporadic breast tumors from Italian patients for the V89L and TA polymorphisms by sequence and fragment analysis, respectively. Total prostatic specific antigen (PSA) concentration in all samples was measured with an ultrasensitive time-resolved immunofluorometric assay, which utilizes two monoclonal antibodies specific for PSA and has a detection limit of 0.001 ng/mL. The results showed that PSA expression was significantly elevated in tumors with VV genotype (p=0.03). LL genotype was found more frequently in younger patients (below 45 years) as well as in grade III patients (P=0.008 and P=0.037 respectively). The presence of LL alleles in breast tumors was associated with shorter disease-free (p=0.01) and overall survival (p=0.01) rates. A statistically significant association between high PSA concentrations and both TA(0)/TA(9) and TA(9) allelotypes was observed (P=0.004). These allelotypes were found rarely in patients at stage III or IV disease. Patients with TA(0)/TA(9) or TA (9) repeats, when compared to those with homozygous TA(0) allele, showed a significant reduction in the risk for relapse (p=0.04). Our results suggest that the genotype of codon 89 and the TA repeat length of the 5α-reductase gene are associated with sporadic breast cancer aggressiveness and age of onset, likely due to altered androgen metabolism.

#5117 ETHNICITY, STAGE OF DETECTION OF BREAST CANCER, AND SCREENING MAMMOGRAPHY IN A HEALTH MAINTENANCE ORGANIZATION. Christine Cole Johnson, Ulka Bawle, and Marianne Ulcickas Yood, *Bristol-Myers Squibb, Wallingford, CT, and Henry Ford Health System, Detroit, MI*

In a cohort of 886 women ascertained from an HMO and diagnosed with breast cancer from 1986-1996, crude 5 year survival for European American women (EA) was better than that for African American (AA) women (OR=1.6; 95%CI 1.1-2.2), with AA women diagnosed at a later stage. We hypothesized that the ethnic difference in stage at diagnosis could have been a result of differential use of screening mammography, although in this setting mammography is a covered benefit and strongly emphasized among the health plan physicians. To investigate this theory, we obtained information from automated data and medical records on the use of screening mammography during the three years prior to diagnosis. Only women who were continuously enrolled in the HMO during this time period were eligible. The women were classified into two age groups, 40-49 yrs. (n=141) and 50+ yrs. (n=295), based on age differences in screening guidelines. Of the 436 women in the study, 28.9% were AA. Young AA women were diagnosed with stages II-IV (65.9%) more frequently than young EA women (47.0%). This difference was much less striking among women 50+ years. In both age groups, AA women were significantly more likely than their EA counterparts

to have not received a screening mammogram (73.2% vs. 40% for younger and 61.2% vs. 31.0% for older women). However, among women 40-49, AA ethnicity was strongly associated with later stage at diagnosis even after adjustment for screening (adjusted OR=2.8; 95%CI 1.2-6.8). Our data suggest that something other than mammography use (e.g. ethnic difference in breast tissue density and therefore mammography efficacy or ethnic difference in tumor aggressiveness), is related to stage at breast cancer diagnosis in young AA women.

#5118 ADENOMATOUS POLYPS AND EPOXIDE HYDROLASE POLYMORPHISMS - RELATION TO SMOKING AND COOKED MEAT CONSUMPTION. Cornelia M Ulrich, J Bigler, J Whitton, L Fosdick, R Bostick, and J D Potter, *Fred Hutchinson Cancer Res Ctr, Seattle, WA*

Epoxide hydrolases play an important role in activation and detoxification of xenobiotics particularly polycyclic aromatic hydrocarbons (PAHs). PAHs are the product of incomplete pyrolysis of organic compounds. They can be activated to reactive metabolites that bind covalently to DNA and form bulky adducts. Some PAHs are known carcinogens. In a study of adenomatous polyps (N cases = 533; N controls = 649), we investigated the role of 2 polymorphisms in exon 3(Tyr113His) and exon 4 (His139Arg) of epoxide hydrolase 1 (EpHX 1) – and their interaction with smoking and meat intake. The age- and sex-adjusted ORs (95% CI) for exon 3 polymorphisms compared to Tyr/Tyr (ref) were Tyr/His: 1.0 (0.8–1.3) and His/His: 1.4 (0.9–2.2). The ORs for exon 4 polymorphisms were all close to 1.0.Current smoking was associated with a 2-fold increase in risk of adenomatous polyps compared to never smokers. The increased risk of colorectal adenoma associated with current smoking was more pronounced among double heterozygotes for the exon 3/ exon 4 EpHX1 polymorphisms (OR=4.9 (2.0-11.9) compared to never smokers with wildtype/wildtype). Fried, baked, or broiled meat intake of >5 servings/wk (high) compared to ≤1 serving/wk (low) was associated with a two-fold increase in risk. Although meat intake explains most of the elevated risk, compared to wildtype/low meat-intake individuals, the highest risks were seen for those with the homozygous variant genotype of exon 3 and moderate (OR=4.2 (1.4–13.0)) or high (OR=2.7 (1.1–6.8)) meat intake. Exon 4 polymorphisms did not modify the risk associated with meat consumption.

#5119 HETEROCYCLIC AMINES IN COOKING FUMES AND LUNG CANCER RISK AMONG CHINESE WOMEN IN SINGAPORE. Adeline Seow, W. T Poh, M. Teh, P. Eng, Y. T Wang, W. C Tan, M. C Yu, and H. P Lee, *National Univ of Singapore, Singapore, Singapore Gen Hosp, Singapore, Tan Tock Seng Hosp, Singapore, and Univ of Southern CA, CA*

Heterocyclic amines are known carcinogens, which have been identified in cooked meat, and also in fumes generated during frying or grilling of meats. We conducted a case-control study of 303 Chinese women with pathologically confirmed, primary carcinomas of the lung, and 765 controls to examine the association between exposure to meat cooking and lung cancer risk. Data on demographic background, smoking status and domestic cooking exposure, including stir-frying of meat, were obtained by in-person interview while in hospital. The proportion of smokers (current or ex-smokers) among cases and controls was 41.7% and 13.1% respectively. Among smokers, women who reported that they stir-fried daily in the past had a significantly increased risk of lung cancer (adjusted odds ratio (OR) 1.9, 95% CI 1.0–3.7) and among these women, risk was enhanced for those who stir-fried meat daily (OR 2.5, 95% CI 1.2–4.8). Women who stir-fried daily, but cooked meat less often than daily did not show an elevated risk (OR 1.0, 95% CI 0.4 – 2.1). Risk was further increased among women stir-frying meat daily who reported that their kitchen was filled with oily fumes during cooking (OR 3.1, 95% C.I. 1.5 – 6.4). Our results suggest that inhalation of carcinogens such as heterocyclic amines generated during frying of meat increases risk of lung cancer among smokers. Further studies in different settings are warranted to confirm these findings, which may also help to explain the higher risk observed among women smokers compared with men.

#5120 CIGARETTE COMPOSITION AS A POSSIBLE EXPLANATION OF US-JAPAN DIFFERENCES IN LUNG CANCER RATES. M V Djordjevic, S D Stellman, T Takezaki, and K Tajima, *American Health Fdn, Valhalla, NY*

US male lung cancer mortality rates greatly exceed those in Japan, despite a much higher prevalence of smoking among Japanese. To find explanations for this anomaly we measured levels of nicotine, "tar", and the carcinogens BaP and NNK in popular American and Japanese cigarettes, and carried out a case-control study in both countries using comparable designs and data collection instruments. BaP is a representative PAH which causes squamous cell lung cancer while NNK is a tobacco-specific nitrosamine which causes adenocarcinoma of the lung in rodents. We interviewed 371 cases and 373 age-matched controls in New York City and Washington, DC, and 410 cases, 252 hospital controls, and 411 age-matched healthy controls randomly selected from electoral rolls in Nagoya, Japan. The odds ratio (OR) for lung cancer in current US smokers relative to non-smokers was 39.2 [95% confidence interval (CI) = 21-71], which was ten times as high as the OR for current smokers in Japanese relative to hospital controls (OR=3.8, 95% CI = 2.0-7.1) and six times higher than in Japanese relative to community controls (OR=6.3, 95% CI = 3.7-10.9). There were no substantial differences in duration of smoking, cigarettes per day, age at onset, or inhalation between US and Japanese smokers. Yields of nicotine were similar for leading brands in both countries (≥ 1.0 mg/cig.). However, yields of "tar", BaP, and NNK were significantly higher in mainstream smoke of U.S. brands. Smoking behaviors by themselves do not appear to explain US-Japan differences in lung cancer rates, but differences in cigarette carcinogen yields may partly explain the observed differences between the two groups.

#5121 *H. PYLORI* INFECTION, SERUM MICRONUTRIENTS AND SUBSEQUENT RISK OF GASTRIC DYSPLASIA OR CANCER IN A HIGH-RISK POPULATION IN SHANDONG, CHINA. Weicheng You, L Zhang, M H Gail, Y C Chang, J F Fraumeni Jr., and G W Xu, *Beijing Institute for Cancer Res, Beijing, China, and National Cancer Inst, Bethesda, MD*

To determine the risk factors for progression of precancerous gastric lesions in Linqu County, China, an endoscopic screening survey was launched among 3,399 adults in this area in 1989-1990. Antibodies to *H. pylori* and levels of serum micronutrients were assayed for approximately 2,300 and 600 adults without gastric cancer (GC) at baseline, respectively. Data on cigarette smoking, alcohol drinking and other characteristics of the participants were obtained by interview. The cohort was subsequently followed, with endoscopic and histopathologic examinations conducted in 1994. Antibodies to *H. pylori* infection, levels of serum micronutrients and other characteristics were compared between those with progression from superficial gastritis (SG), chronic atrophic gastritis (CAG), or intestinal metaplasia (IM) to dysplasia (DYS) or GC vs. those with no change or with regression seen in 1994. Infection with *H. pylori* at baseline (OR=1.4, 95% CI, 1.0—1.9) was associated with progression to DYS/GC during the 4.5-year follow up. The risk of progression to DYS/GC increased with the number of years of smoking cigarettes and with number of cigarettes smoked. In contrast, risk of progression to DYS/GC decreased by 70% (OR=0.3, 95% CI, 0.1–0.7) among persons with 1989–1990 ascorbic acid levels in the highest tertile, as compared with those to lower levels. No such associations were observed between the progression of DYS/GC and other micronutrients including retinol, beta-carotene, alpha-tocopherol, selenium, ferritin and zinc:copper ratio. The findings suggest that *H. pylori* infection, cigarette smoking and lower levels of dietary vitamin C contribute to the progression of precancerous lesions in leading to GC in this high-risk population.

#5122 THE EPIDEMIOLOGY OF HEPATOCELLULAR CARCINOMA: INTERACTIONS BETWEEN ATOMIC-BOMB RADIATION, CIGARETTE SMOKING AND HEPATITIS B AND C INFECTIONS. Gerald B Sharp, Terumi Mizuno, John B Cologne, Shoji Tokuoka, and Kiyohiko Mabuchi, *Radiation Effects Res Fdn, Hiroshima, Japan*

We conducted a nested case-control, epidemiologic study using subjects drawn from the Life Span Study cohort of approximately 120,000 Hiroshima and Nagasaki residents, who were both exposed and non-exposed to radiation from the 1945 Atomic-bombings. A total of 307 hepatocellular carcinoma (HCC) cases and 897 autopsied controls who died from 1952-1997 were included. Controls were frequency matched to cases on age, sex, year of death, city of residence, and radiation exposure. Archival tissue samples were assessed for hepatitis B virus (HBV) status using staining and PCR. Reverse transcriptase (RT) PCR was used to determine hepatitis C virus (HCV) status. Radiation exposure estimates were based on physical calculations of yield combined with individual data about location during bombing and shielding by buildings, terrain, and body tissue; liver dose was estimated as a sum of the gamma and neutron dose with the latter multiplied by 10 because of its higher biological effectiveness. Cigarette smoking history was assessed using interviews and mail surveys. Adjusting for confounders, we found a significant interaction between radiation exposure and cigarette smoking (p = 0.01). Restricting analysis to HCC cases without cirrhosis, we found a significant interaction between liver irradiation and HCV infection (p = 0.04). Among radiation exposed and non-exposed subjects, the odds ratios of HCC for HCV infection were 23.6 (95% C.I.: 6.57-97.34) and 3.0 (95% C.I.: 0.72-11.29), respectively. We found a significant antagonism between HBV and radiation exposure (p = .05), which appears to reflect the selective loss from this study of HBV-infected a-bomb survivors who died from HCC too early to be included.

#5123 THE NAD(P)H:QUINONE OXIDOREDUCTASE (NQO1) INACTIVATING C609T POLYMORPHISM IS ASSOCIATED WITH ACUTE LEUKEMIA. Y. Wang, G. Morgan, J. Wiemels, E. Kane, E. Roman, S. Rollinson, R. Cartwright, and Martyn T Smith, *Univ of CA, Berkeley, CA, and Univ of Leeds, Leeds, United Kingdom*

The causes of acute leukemia are largely unknown, although interindividual differences in multiple genetic loci are thought to influence risk of this disease. In this study we examine genetic differences in adult leukemia cases compared to matched controls in NAD(P)H:quinone oxidoreductase (NQO1), an enzyme implicated in the detoxification of quinones. A C ->T substitution polymorphism at nt 609 of the NQO1 cDNA (NQO1 C609T) results in a proline to serine substitution which is associated with a loss of NQO1 activity. This polymorphism has recently been associated with leukemias secondary to chemotherapy and also infant leukemias with *MLL* translocations, as well as being a risk factor for hematotoxicity by the leukemogen, benzene. Peripheral blood DNA samples in a population -based case-control study in England of 555 adult acute leukemia patients and 947 unaffected, age, sex, and geographically matched controls were genotyped for NQO1. The frequency of cases with low NQO1 activity (homozygous mutant + heterozygote) was significantly higher among total acute leukemia cases compared to their matched controls, odds ratio (OR) 1.32, 95% Confidence Interval (CI) 1.05–1.65. Acute lymphoblastic leukemia (ALL) cases exhibited a higher ratio

DEVLOPING A CULTURALLY APPROPRIATE BREAST CANCER RISK FACTOR SURVEY FOR AFRICAN AMERICAN WOMEN: FOCUS GROUP RESULTS.

Ford ME, Hill D, Morrison J, Worsham MJ, Wolman S, and Johnson, CC

Resource Center for Minority Aging Research and Josephine Ford Cancer Center, Henry Ford Health System, Detroit, MI 48202

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Clinical decision-making algorithms and public policies are typically based on the results of research using measurement instruments. These algorithms and policies affect the manner in which health care is provided. Therefore, it is important to assess the cultural appropriateness of measurement instruments for use with specific populations. This presentation describes the results of guided focus groups held in 1998 with African American women. Focus group participants responded to items compiled from standardized surveys on breast cancer risk factors. The first focus group (n=12) was held with African American women aged 18-50 years randomly selected from the Henry Ford Health System patient population. A second focus group was held with nine randomly selected African American women aged 50+ years. A sample set of focus group questions referring to a specific table in the breast cancer risk factor survey include: (a) Are the instructions on how to fill out the table clear to you?; (b) If not, how could they be made clearer?; (c) How would you feel if you were asked to complete this table?; (c) Are the words in the table clear to you?; (d) If not, which words would you use to describe these things?; and (e) How does the layout of the table look to you? The results of the focus group revealed several categories related to the survey design. These categories include the overall content of the survey, survey questions requiring calculations or detailed remembrances of past events, privacy and confidentiality issues, and the overall experience of completing the survey. The results of this research show that breast cancer risk factor survey questions developed in the general population may not be appropriate for use with African American women.

The U.S. Army Medical Research and Materiel Command under DAMD17-96-1-6246 supported this work.

BREAST CANCER INCIDENCE AMONG A COHORT OF WOMEN WITH BENIGN BREAST DISEASE.

CC Johnson, AC Blount, U Raju, J Abrams, M Jankowski, SD Nathanson, SR Wolman, MJ Worsham

Josephine Ford Cancer Center, Henry Ford Health System, Detroit, MI.

E-Mail: cjohnso1@hfhs.org

The risk of developing breast cancer has been reported to be increased among women with a history of benign breast disease (BBD). To investigate this relationship, a cohort was established of women who were diagnosed with BBD in a health care system from 1981 – 1994. Women were eligible for entry with an initial index BBD biopsy performed during this time period. The archived pathology reports of all breast biopsies were retrieved and reviewed by an expert breast pathologist to identify specimens containing only BBD lesions. The slides were microscopically reviewed for confirmation of the diagnosis utilizing a universal diagnostic terminology system. Subjects with a diagnosis of breast cancer prior, concurrent or within 6 months of the index BBD biopsy were ineligible. All cohort members were followed from their index BBD biopsy for the subsequent occurrence of breast cancer. During cohort establishment, 5254 women were found to be eligible and 116 ineligible. Slide review revealed the lesions were primarily proliferative, 65%, with 30% non-proliferative, and 4% atypical ductal or lobular hyperplastic. The cohort yielded 167 cases of breast cancer detected through July 1999. With 48,201 person-years of follow-up, the average incidence rate was 346.5 per 100,000 (95% confidence interval 295.9 – 400.8). Follow-up is not yet complete; however the average incidence rate appears to be comparable to the 1991 – 1995 SEER rates of 353.8 nationally and 363.6 per 100,000 for the metropolitan Detroit area, among women aged 50 and older. For years in which follow-up is more complete (1981-1991), incidence rates showed an increasing trend.

The U.S. Army Medical Research and Materiel Command under DAMD17-96-1-6246 supported this work.

Title:

Ethnicity, stage of detection of breast cancer, and screening mammography in a health maintenance organization.

Abstract:

In a cohort of 886 women ascertained from an HMO and diagnosed with breast cancer from 1986-1996, crude 5 year survival for European American women (EA) was better than that for African American (AA) women (OR=1.6; 95%CI 1.1-2.2), with AA women diagnosed at a later stage. We hypothesized that the ethnic difference in stage at diagnosis could have been a result of differential use of screening mammography, although in this setting mammography is a covered benefit and strongly emphasized among the health plan physicians. To investigate this theory, we obtained information from automated data and medical records on the use of screening mammography during the three years prior to diagnosis. Only women who were continuously enrolled in the HMO during this time period were eligible. The women were classified into two age groups, 40-49 yrs. (n=141) and 50+ yrs. (n=295), based on age differences in screening guidelines.

Of the 436 women in the study, 28.9% were AA. Young AA women were diagnosed with stages II-IV (65.9%) more frequently than young EA women (47.0%). This difference was much less striking among women 50+ years.

In both age groups, AA women were significantly more likely than their EA counterparts to have not received a screening mammogram (73.2% vs. 40% for younger and 61.2% vs. 31.0% for older women). However, among women 40-49, AA ethnicity was strongly associated with later stage at diagnosis even after adjustment for screening (adjusted OR=2.8; 95%CI 1.2-6.8). Our data suggest that something other than mammography use (e.g. ethnic difference in breast tissue density and therefore mammography efficacy or ethnic difference in tumor aggressiveness), is related to stage at breast cancer diagnosis in young AA women.

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Breast cancer incidence among a cohort of women with benign breast disease. AC Blount, U Raju, J Abrams, M Jankowski, SD Nathanson, SR Wolman, MJ Worsham, CC Johnson. Josephine Ford Cancer Center, Henry Ford Health System, Detroit, MI.

The risk of developing breast cancer has been reported to be increased among women with a history of benign breast disease (BBD). A cohort of women diagnosed with BBD from 1981 – 1994 was established to investigate this relationship in a large health care system. Women were eligible for entry with an initial index BBD biopsy performed during this time period. A diagnosis of breast cancer prior, concurrent or within 6 months of the index BBD biopsy ruled women ineligible for the cohort. The archived pathology reports of all breast biopsies were retrieved and reviewed by an expert breast pathologist to identify specimens containing only BBD lesions. The slides were microscopically reviewed for confirmation of the diagnosis utilizing a universal diagnostic terminology system. All cohort members were followed from their index BBD biopsy for the subsequent occurrence of breast cancer. During cohort establishment, 5254 women were found to be eligible and 116 ineligible. Slide review revealed the lesions were primarily proliferative (65%), with 30% non-proliferative, and 4% atypical ductal or lobular hyperplastic. The cohort yielded 167 cases of breast cancer detected through July 1999. With 48,201 person-years of follow-up, the average incidence rate was 346.5 per 100,000 (95% confidence interval [CI], 295.9 – 400.8), ranging from 298.3 (95% CI, 148.9 – 534.0) in the 1981 cohort year to 530.8 in 1994 (95% CI, 254.8 – 976.6). In comparison to 1991 – 1995 SEER rates of 353.8 nationally and 363.6 per 100,000 for the metropolitan Detroit area among women aged 50 and older, breast cancer incidence in this BBD cohort does not appear to differ from the general population.

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USING GUIDED FOCUS GROUPS IN BREAST CANCER RESEARCH

Authors: Ford, M.E.; Hill, D.; Worsham, J.M.; Johnson, C.C.; Wolman, S.

Objective: To describe the results of two age-specific guided focus groups held with African American women to evaluate a breast cancer risk factor survey.

Methodology: A health system patient database was used to identify African American women aged 18 to 50 years (focus group one) and aged 50 years or older (focus group two). From these listings, 15 women were randomly selected, called, and invited to each focus group. Eligible and interested women received a mailed confirmation of their focus group and a reminder call. Each 2-hour focus group was videotaped.

Results: The women in the younger age group (n=12) stated that the rationale for the item on race/ethnicity was not clear, the relevance between parent's country of origin and breast cancer risk was not clear, and it was difficult to remember the number of menstrual periods they had had in previous decades. The women in the older age group (n=9) stated that in the past, their doctors did not name their medications. The meaning of several terms, such as "demographics," was not clear, and family medical history was often unknown. Women in both age groups stated that it was difficult to recall previous average weight, alcohol consumption, and level of physical activity, and that the sports listed were not culturally appropriate.

Conclusion: The results show that questionnaire items developed in the general population may not be appropriate for African American women.

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Developing a culturally appropriate breast cancer risk factor survey for African American women. Ford ME, Hill D, Worsham MJ, and Johnson, CC. *Josephine Ford Cancer Center, Henry Ford Health System, Detroit, MI 48202*

The purpose of this study was to develop a culturally appropriate breast cancer risk factor survey. Guided focus groups were conducted using items compiled from standardized surveys on breast cancer risk factors. The first focus group (n=12) was held with African American women aged 18-50 years randomly selected from the Henry Ford Health System patient population. A second focus group was held with nine randomly selected African American women aged 50+ years. Each two-hour focus group was videotaped. The women in the younger age group stated that the rationale for the item on race/ethnicity was not clear, the relevance between parent's country of origin and breast cancer risk was not clear, and that it was difficult to remember the number of menstrual periods they had had in previous decades. In the younger age group, breast cancer risk factors cited included heredity, smoking, underwire brassieres, chemical exposure, breast density, weight, drug use, and lack of estrogen exposure. The women in the older age group stated that in the past, their doctors did not name their medications or describe the full extent of their medical conditions. The meaning of several terms, such as demographics, was not clear, and family medical history was often unknown. In the older age group, breast cancer risk factors cited included heredity, hormone replacement therapy, diet, lack of breast self-exams and mammography, and estrogen exposure. Women in both age groups stated that it was difficult to recall previous average weight, alcohol consumption, and level of physical activity, and that the sports listed were not culturally appropriate. The results show that questionnaire items developed in the general population may not be appropriate for African American women, and that education about breast cancer risk factors is needed for this population.

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Incidence rates for breast cancer among women with benign breast disease.
CC Johnson, AC Blount , U Raju , J Abrams, SR Wolman, MJ Worsham.
Josephine Ford Cancer Center, Henry Ford Health System, Detroit MI.

Women with benign breast disease (BBD) have been shown to be at higher risk for breast cancer. A cohort of women with (BBD) from 1981-1989 in a large health system was ascertained. Hard copy records of all pathology files were reviewed and reports of breast biopsies pulled. These reports were reviewed by a pathologist specializing in breast lesions and classified as BBD versus other categories. Women with a concurrent or past history of breast cancer were excluded from the cohort. Women with a diagnosis of breast cancer within the six months following biopsy were also excluded.

All members of the cohort were (n=2263) followed for the occurrence of breast cancer through 1997. Follow-up commenced with the first biopsy classified as BBD. One hundred thirty one cases were identified over 21,317 person-years of follow up. The average incidence rate per year was 615 per 100,000 (95% confidence interval of 518-729). This compares to a SEER rate of 350.2 per 100,000 for women ≥ 50 years from 1990-94.

The incidence rates for breast cancer in this BBD cohort appear to be higher than those found in the same metropolitan area or as reported by SEER for the general population. Further analyses will stratify rates by race, age, and histologic type.

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Ethnicity and Survival from Lung Cancer in a Managed Care Organization.
Ulcickas Yood M, Blount A Coates R, Lamerato L, Abrams J, , Johnson CC

Studies indicate African Americans (AA) with lung cancer have poorer survival than non-AA We measured lung cancer survival among members of a Detroit area health maintenance organization who were served by physicians in a large multispeciality group practice. In this setting, many potential barriers related to insurance are removed, and diagnosis and treatment are relatively standardized. All lung cancer cases diagnosed from 1/86-12/96 among HAP members continuously enrolled for at least one year formed the cohort. Baseline data included race, date of birth, sex, marital status, and stage. Address was geocoded to census block group to obtain an estimate of median household income.

The cohort consisted of 827 patients, 280 AA and 547 non-AA. Mean ages and stage at diagnosis were similar. Median income was substantially different comparing AA ($18,200) and non-AA ($35,600). Overall, AA had poorer survival compared to non-AA (hazard ratio HR=1.20, 95%CI 1.02-1.42). Adjusting for income, the HR decreased to 1.05 (95%CI 0.85-1.31). Adjusting for stage, income, age, sex and marital status, the RR was 1.00 (95% CI of 0.80-1.27).

In a setting that removes a number of health care barriers and potential treatment differences, and after adjustment for stage and other socio-demographic variables, the survival difference between AA and non-AA was eliminated.

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Intraobserver Reliability in Classifying Breast Lesions in a Cohort of Women with Benign Breast Disease. Abrams J, Raju U, Worsham MJ, Johnson CC, Ulickas Yood M, Wolman SR. *Josephine Ford Cancer Center, Henry Ford Health System, Detroit MI.*

We identified a cohort of women with benign breast disease diagnosed by breast biposy during the years 1981 through 1994. The study pathologist reviewed histology slides of breast biopsies to identify lesions using a classification based on risk categories for invasive carcinoma defined by Page and Dupont. A 10% random sample of slides, N=74, from years 1981 through 1983 was independently reviewed a second time by the same pathologist who was blinded at both readings to the identity of the patient.

Lesions with no increased risk included simple apocrine metaplasia, cysts, duct ectasia, mastitis, fibrosis, squamous metaplasia. Concordance on the two readings ranged from 85% for simple apocrine metaplasia to 99% for squamous metaplasia. Average agreement was 91%. Kappa statistics indicated significantly greater than chance agreement ($p<.001$) for all lesions but fibrosis. Lesions with slightly increased risk included moderate to florid adenosis (both simple and sclerosing), moderate to florid hyperplasia, and papillomas. Fibroadenomas, apocrine adenosis and radial scars are also regarded as proliferative lesions, i.e. having slightly increased risk, for the purpose of this study. Concordance ranged from 93% for simple adenosis and hyperplasia to 99% for apocrine hyperplasia with a mean of 96%. All kappa statistics indicated significantly more than chance agreement, $p<.001$. Lesions with moderately increased risk are atypical ductal hyperplasia (ADH) and atypical lobular hyperplasia (ALH). One case of ADH and no cases of ALH were found and the pathologist agreed at both readings. No high-risk lesions, i.e. ductal or lobular carcinoma in situ were found. We conclude that a trained breast pathologist can reliably classify lesions of different risk categories.

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Ethnicity, stage of detection of breast cancer, and screening mammography in a health maintenance organization. CC Johnson, U Bawle, ME Ulcickas Yood, Henry Ford Health System, Detroit MI 48202

In a cohort of 886 women ascertained from a health maintenance organization and diagnosed with breast cancer from 1986-1996, we found that crude 5 year survival for European American women (EA) was better than that for African American (AA) women (OR=1.6; 95%CI 1.1-2.2). AA women were diagnosed at a later stage, and the survival difference disappeared after adjusting for stage along with several demographic variables. We hypothesized that the ethnic difference in stage at diagnosis could have been a result of differential use of screening mammography as such differences have been found in other studies, although in this setting mammography is a covered benefit and strongly emphasized among the health plan physicians. To investigate this theory, we obtained information from automated data and medical records on the use of screening mammography during the three years prior to diagnosis. Only women who were continuously enrolled in the HMO during this time period were eligible. The women were classified into two age groups, 40-49 yrs. (n=141) and 50+ yrs. (n=295), based on age differences in screening guidelines. Of the 436 women in the study, 28.9% were AA. AA women were found to have lower income than EAs, and older AA women were less likely to be married. Young AA women were diagnosed with stages II-IV (65.9%) more frequently than young EA women (47.0%). This difference was much less striking among women 50+ years. Late stage disease was associated with shorter duration of HMO membership (OR=1.3, 95% CI 0.6-2.5). In both age groups, AA women were significantly more likely than their EA counterparts to have not received a screening mammogram (73.2% vs. 40% for younger and 61.2% vs. 31.0% for older women). However, among women 40-49, AA ethnicity was strongly associated with later stage at diagnosis even after adjustment for screening (adjusted OR=2.8; 95%CI 1.2-6.8). Our data suggest that something other than mammography use (e.g. ethnic difference in breast tissue density and therefore mammography efficacy or ethnic difference in tumor aggressiveness), is related to stage at breast cancer diagnosis in young AA women.

APPENDIX E.

Selected Papers

Center for Medical Treatment Effectiveness Programs
1 Ford Place, Suite 3E, Detroit, MI 48202 (313) 874-1890 Fax (313) 874-6944

October 18, 2000

Rose Mary Carroll-Johnson, MN, RN
Editor, *Oncology Nursing Forum*
P.O. Box 801360
Santa Clarita, California 91380-1360 USA

Dear Ms. Carroll-Johnson:

Please find enclosed a manuscript entitled "Developing a Culturally Appropriate Breast Cancer Risk Factor Survey for African American Women". Your consideration of this manuscript for publication in *Oncology Nursing Forum* is greatly appreciated. This manuscript is being submitted only to *Oncology Nursing Forum*. It will not be submitted elsewhere while under your consideration. It has not been published elsewhere and, if it is accepted for publication in *Oncology Nursing Forum*, it will not be published elsewhere without express permission of the editors. Also enclosed are signed statements from each author indicating that they have participated sufficiently in the conception and design of this work, the data analysis, and the writing of this manuscript to take public responsibility for it. They have reviewed the final version of the submitted manuscript and approve it for publication.

Thank you for your consideration of this manuscript. If you have any questions regarding the enclosed materials, please feel free to contact me. My work telephone number is 313-874-5433, my home telephone number is 313-567-7435 and my fax number is 313-874-6944. My e-mail address is: mford1@hfhs.org.

Sincerely,

Marvella E. Ford

Marvella E. Ford, Ph.D.
Associate Research Scientist

confidential — under review

Developing a Culturally Appropriate Breast Cancer Risk Factor Survey for African American Women

Marvella E. Ford, Ph.D.[1]
Deanna D. Hill, M.P.H.[2]
John Morrison, B.S.[3]
Maria Worsham, Ph.D.[4]
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ABSTRACT

Purpose/Objectives: To evaluate a breast cancer risk factor survey for use with African American women.

Design: Two focus groups consisted of women randomly selected from patients at Henry Ford Health System in Detroit, MI.

Setting: A large, vertically integrated, private, non-profit health system.

Sample: Focus group one consisted of 11 African American women aged 18-50 years, with a mean age of 41.0 years. Focus group two was composed of 9 African American women aged 50+ years, with a mean age of 60.9 years.

Methods: A grounded theory approach was used to analyze the data.

Main Research Variables: Perceptions of breast cancer risk.

Findings: In the younger age group, the women had difficulty remembering information related to the risk factors of menstruation history, contraceptive history and past tobacco use. Women in the older age group indicated that they did not know the cause of death of many previously deceased family members and that they did not know the names of contraceptive medicine taken in the past because their doctors did not share this information with them.

Conclusions: Breast cancer risk factors were perceived differently by the younger women than the older women.

Implications for Nursing Practice: The findings could lead to the development of culturally- and age- appropriate nursing interventions designed to address breast cancer risk perceptions in order to enhance the likelihood of adherence to recommended mammography screening guidelines.

INTRODUCTION

Breast cancer affects the mortality of African American women in disproportionate numbers relative to their Caucasian counterparts (Chu, Baker & Tarone, 1999; Chu, Tarone & Brawley, 1999; Philips, Cohen & Moses, 1999; Howard, Penchansky & Brown, 1998; Wu, Semenya, Hardy, Robinson, Pederson, Sung & Haynes, 1998; Gorey et al., 1997; Earp, Altpeter, Mayne, Viadro & O'Malley, 1995; Thomas & Flick, 1995; Roberson, 1994). In fact, while breast cancer mortality rates have decreased for Caucasian women, these rates have not decreased in a commensurate fashion for African American women (Chu, Tarone & Brawley, 1999; Howard, Penchansky & Brown, 1998). Differential breast cancer screening practices may contribute to differential breast cancer diagnoses and treatment outcomes by racial group (Philips, Cohen & Moses, 1999).

However, health beliefs, such as perceptions of breast cancer risk, appear to affect breast cancer screening behavior (Womeodu & Bailey, 1996; Pearlman, Rakowski, Ehrich & Clark, 1996; Yancey, Tanjasiri, Klein & Tunder, 1995; Roberson, 1994; Stein, Fox, Murata & Murisky, 1992). As Chu et al. (1999) note, African American women have not benefited as much from advances in breast cancer early detection as Caucasian women. This finding is corroborated by other researchers as well (McCarthy, Ulcickas, Boohaker, Ward, Rebner & Johnson, 1996; Yancey, Tanjasiri, Klein & Tunder, 1995). Previous research suggests that African American women express more doubts about the efficacy of medical care and feel less at risk for breast cancer than Caucasian women (McCarthy, Ulcickas, Boohaker, Ward, Rebner & Johnson, 1996; Pearlman, Rakowski, Ehrich & Clark, 1996). In contrast, McCarthy, Ulcickas, Boohaker, Ward, Rebner & Johnson (1996) found that patient perceptions of mammography were not related to follow-up of abnormal mammographic results requiring immediate follow-up. Instead,

immediate follow-up was found to be related to difficulty in obtaining medical appointments. However, McCarthy, Ulcickas, Boohaker, Ward, Rebner & Johnson (1996) also found that the women in their study who required follow-up in four to six months from the initial mammography screening but were not compliant were more likely than other women to have not adhered to breast cancer screening guidelines in the past.

Understanding how African American women perceive survey questions designed to elicit information about breast cancer risk can be useful and can lead to modifications to these questions to make them more culturally appropriate, which will result in higher data quality. In addition, an understanding of these perceptions can be used to enhance breast cancer screening interventions to maximally reach African American women by addressing culturally based perceptions (Chu, Baker & Tarone, 1999; Chu, Tarone & Brawley, 1999). Therefore, culturally appropriate breast cancer risk factor surveys can be used to identify women for whom more intensive breast cancer screening promotion might be necessary and to identify women for whom intensive surveillance following an abnormal screening result might be needed. In addition, clinical decision-making algorithms and public policies are typically based on the results of research using measurement instruments. These algorithms and policies affect the manner in which health care is provided. Therefore, it is important to assess the cultural appropriateness of measurement instruments for use with specific populations. The purpose of this study was to evaluate a breast cancer risk factor survey for use with African American women.

In order to ascertain perceptions of the breast cancer risk factor survey, focus groups were used. Focus groups were chosen as a mode of data collection because they can be a rich source of information. In a focus group, data are collected from a homogeneous group of individuals using a predetermined, structured sequence of questions in a focused discussion (Kohler et al.,

1993). In general, focus groups are conducted with individuals representative of the population(s) that will complete the survey. Focus groups can help develop/modify questions that have meaning for each population and allow for an in-depth exploration of the knowledge, attitudes and beliefs of specific cultural groups (Nymanthi & Shuler, 1990; Blumer, 1998; Beaudin & Pelletier, 1996).

RESEARCH DESIGN AND METHODS

Sample Selection

The methods used in conducting the focus group are shown in Figure 1. As may be seen, a 20-page moderator's guide based on the existing breast cancer risk factor survey was developed. The Henry Ford Health System (HFHS) Corporate Data Store, an administrative database, was used to randomly select potential participants who were African American women aged 18-50 years (focus group one) and aged 50+ years (focus group two) who had made at least one visit to HFHS in the first six months of 1998. From this listing of potential participants, women were randomly selected to be called by telephone and invited to participate in a focus group. A short eligibility screener was conducted during the invitational call. In addition, the $40 honorarium was described. Eligible and interested women were sent a written confirmation of their focus group date, time, and location. Transportation to the focus groups was not provided. The women received a reminder call the night before their scheduled focus group session.

The focus groups included women in two age groups primarily because we were interested in ascertaining whether perceptions of breast cancer risk might differ by age cohort. In conducting the focus groups, the following procedures were used. During each focus group, the moderator, assistant, and recorder were African American women under 40 years of age. The two-hour focus groups were videotaped and audiotaped. In addition, written notes were taken during each focus

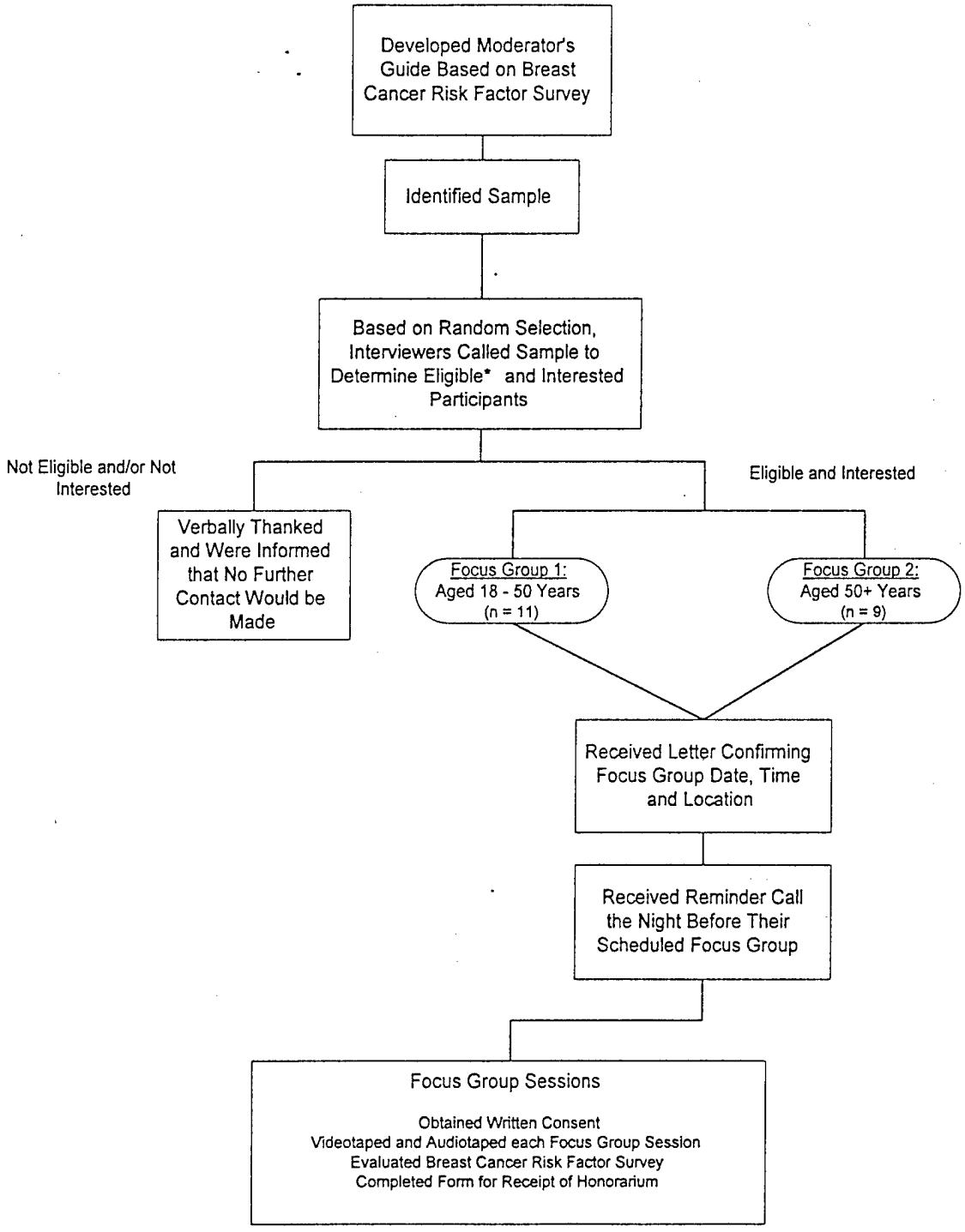
group as a supplement to the mechanical recording devices (Sim, 1998). Prior to each focus group, participants signed a consent form and received a packet containing a nameplate (for identification of participants to the moderator), a copy of the survey to be evaluated, and a body image pictograph. The purpose of the focus group was explained, and participants were encouraged to freely voice their opinions. Confidentiality ground rules were laid. The focus groups began with a icebreaker. Then, the moderator began asking questions.

Sample sets of questions referring to a specific table in the breast cancer risk factor survey include: Are the instructions on how to fill out the table clear to you? If not, how could they be made clearer? How would you feel if you were asked to complete this table? Are the words in the table clear to you? If not, which words would you use to describe these things? How does the layout of the table look to you? Following the completion of the focus groups, participants signed a receipt and were given a $40 honorarium. Women in both age groups were asked exactly the same questions.

Analysis

Content analysis of the focus group transcripts was conducted. The transcripts were independently coded by the investigators and were checked for accuracy against notes taken during the focus groups (Beaudin & Pelletier, 1996). The coding process was based on grounded theory, which provides a systematic approach to identifying themes in the data (Thom & Campbell,1997). Statements emerging from the data were identified (open coding) and grouped into conceptual categories or themes (axial codes) by consensus among the investigators (Blumer, 1998; Thom & Campbell,1997; Nymanthi & Shuler, 1990). Themes that were common across both age groups were identified, as well as themes unique to a particular group.

Methods Used in the Focus Group Study



*confirmed age, race/ethnicity, and gender

RESULTS

Focus group one consisted of 11 African American women. The mean age of the women in this group was 41.0 years, with a range of 29-48 years (standard deviation = 6.3 years). Focus group two was composed of 9 African American women. This group had a mean age of 60.9 years, with a range of 51-77 years (standard deviation =8.2 years).

The focus group results are shown in tables 1-7. Each response that is presented in a particular category in the tables reflects a unique individual response; multiple statements by the same participant were not listed within each category. Table 1 shows the responses of the study participants when they were asked to name some breast cancer risk factors. As may be seen, there was little overlap between the responses provided by members of the two age groups, with the exception of response to survey questions related to genetic breast cancer risk factors. The women in the younger age group appeared to be better informed about risk factors than the women in the older age group, although some of the information provided by members of the younger age group is actually erroneous. For example, one of the members of this group, who happened to be a nurse, stated that lack of exposure to estrogen was a breast cancer risk factor. Also, factors such as wearing underwire brassieres were mentioned.

Insert Table 1 About Here

The study participants were questioned regarding the solicitation of pregnancy history information. It is interesting to note that privacy of information was an issue for the younger women but apparently was not an issue for women in the older group. As a woman in the

younger age group stated "You may not want someone to know you've suffered the pain of miscarriages or still births ... even abortions".

Table 2 shows concerns raised by the participants about the confidentiality of the information provided in the survey. While the women in both age groups appeared to be concerned about what would be done with the information provided, one woman in the younger age group appeared to confuse the meaning of the terms "confidential" and "anonymous".

Insert Table 2 About Here

Despite the concerns regarding the extent of the confidentiality of the survey, women in both age groups expressed a similar level of comfort in responding to questions regarding their past medical conditions. As women in the younger age group stated "When you go to a doctor, the first thing they ask you is about your medical history ...you're used to it", "Pregnancy history is no secret", "You said our names are not going to be used. So it's not like my husband's going to hear this or my next door neighbor". A participant in the older age group stated "All this information (demographic data) is on the computers...They know everything about us". While it was not clear who the "They" mentioned by this participant included, it was clear that she did not have strong feeling against being asked to provide information about her past medical conditions.

As may be seen in Table 3, members of both age groups indicated that they would have difficulty answering questions related to their family health history, albeit for different reasons. In the younger age group, two women stated that they would have difficulty answering questions about the health histories of the men in their families because they either did not know these histories or did not know these men. In contrast, women in the older age group indicated that

they would have difficulty answering questions related to their family health history because the cause of death of many older deceased family members was unclear.

Insert Table 3 About Here

Table 4 shows that women in the younger age group had difficulty remembering questions related to menstruation history, contraceptive history, and past tobacco use. A common theme across age groups was the lack of remembrance of the names of previously used contraceptive devices.

Insert Table 4 About Here

In addition to difficulty remembering past events, participants in the younger age group expressed difficulty in quantifying amounts of alcohol used previously "Who knows what a 4 oz. glass of wine is?" and "You could ask (instead) 'How many bottles of beer did you have'", women in the older group questioned the quantification of menstrual flow "I don't know how accurate it would be, number of pads. Some of us might use four pads and some might use twelve, not that they needed it. Some are just like that. So the number of pads here would not help you in a study because people are so different", "I think that the days of the cycle would determine the number of pad-protected days".

It was interesting to note that in response to being asked the meaning of the phrase "health risk", women in the younger age group indicated that a "health risk" was something independent of their own behavior or actions, stating "There is something I'm taking or that I'm going to take that is going to harm me", and "Something in the environment". In contrast, four women in the

older age group mentioned smoking as a health risk factor, and another woman in this age group discussed second-hand smoke as a risk factor.

When questioned about their preferred mode of survey administration, women in the younger age group stated that they did not want the survey questions to be administered via home interview. The women stated "I don't want a home interview", "They (interviewers) would really have to prove themselves coming to my home. People do so many scams", and "I'd rather do a clinic interview". However, two women in this group stated that if the interviewers called first to make an appointment with them, they would not mind participating in a home interview. In the older age group, all of the women shook their heads negatively when asked whether they would like to have the survey administered via telephone. Seven participants voted for a mailed survey that would be returned via postage-paid mail and two participants voted for a face-to-face mode of administration. Another participant in this group suggested providing study participants with a contact telephone number that they could call if they had difficulty answering a question.

Reported motivation to complete the survey differed between responses provided by the two age groups. Two women in the younger age group stated that they felt completing the survey would help themselves "...the information I would be giving the surveyors would help whatever problem I'm having, to solve it", "...helping someone else who might have a problem similar to yours". However, two women in the older age group stated that they would complete the survey because doing so might help other women or future generations "I would fill it out because it's a study of women and I have two daughters who are young women now. If something should happen where this study might help with diagnosis for them, anything that will help is not going to hurt", "It's (completing the survey) a benefit. I have nine daughters, so the information would help them. I have no problems with it", "I'd do it because as a group of women, Black women

don't tend to want to do these (completing a survey) things for various reasons... we don't get a lot (of information) about women... I just feel like that's the only way you're going to get it (the information)".

Table 5 shows the responses of the study participants to the question of racial identification. As may be seen, women in the younger age group had questions about the relevance of the racial identification question to the aims of the survey. The women indicated that they were not averse to providing information related to their racial backgrounds but that they wanted know the relevance of this information to their health. In contrast, women in the older age group instead questioned the relevance of parent's country of origin to their own racial identity.

Insert Table 5 About Here

Women in both age groups commented upon the clarity of the terminology used in the survey. In particular, the term "ionizing radiation" was unclear to both groups of women. Also, in the older age group, the term "demographic" was unclear. One participant suggested using the term "general background" instead.

Other themes that emerged from the data were relevant to only one age group. For example, in the younger age group, the cultural relevance of the exercise questions, embarrassment, health problems, pain, and legitimacy of the survey emerged as themes (Table 6). In terms of cultural relevance of the exercise questions, the women in the group raised questions about the types of sporting activities listed in the survey. They noted that some of these sporting activities, such as playing tennis, would not apply to the African Americans with whom they interacted. The study

participants also suggested additional sporting activities that could be added to this list, such as dodgeball, volleyball, and jogging.

In the older age group, emerging themes were cohort effects, intergenerational concerns, comfort in completing items in the section of the survey labeled "Menstruation and Menopause History", and denial of disease. That is, the women in this group indicated that because of different medical practices in previous years, their health care providers did not always give them the names of their birth control medication. In addition, the older women expressed an interest in helping to improve the health of their families' future by completing the survey. Two of the participants in this group raised the issue of denial of breast cancer, and two other women in this group indicated that the significance of the section on menstruation and menopause history, and the measurement of menstrual flow, were not clear.

Insert Table 6 About Here

Insert Table 7 About Here

DISCUSSION

Health beliefs such as perception of breast cancer risk may affect cancer-screening behavior. The purpose of this study was to assess the responses of two groups of African American women (aged 18-50 years and aged 50+ years) to a breast cancer risk factor survey, with the aim of ascertaining the perceptions of breast cancer risk factors held by the women, and incorporating their responses into a culturally appropriate survey.

It is clear from the results of the focus groups that breast cancer risk factors were perceived differently by the younger African American women than the older African American women. In the younger age group, the participants stated that they had difficulty remembering information related to menstruation history, contraceptive history and past tobacco use, suggested including sports such as dodgeball, volleyball and baseball in the section of the survey related to exercise in order to make this section more culturally relevant, had difficulty quantifying amounts of alcohol used previously and difficulty quantifying menstrual flow, showed a preference against having the survey administered via home interview, indicated a desire to complete the survey as a means of helping other women, had questions regarding the relevance of the racial identification question to breast cancer risk, voiced concern about the cultural relevance of the questions related to exercise, showed embarrassment about completing the items related to alcohol use, indicated that they had serious health problems and experienced a great deal of pain, expressed concern about the lack of clarity of terminology used in the survey, and commented that the legitimacy of the survey would be enhanced if it were sent in an "official" Henry Ford Hospital postage paid envelope. In addition, the women in the younger age group expressed concern about the privacy of the information provided as part of the survey,

In contrast, women in the older age group indicated that they did not know the cause of death of many previously deceased family members and that they did not prefer to have the survey administered via telephone but would prefer a mailed survey. These women also indicated being motivated to complete the survey in order to help future generations of family members.

Members of the older age group also questioned the relevance of their parent's country of origin to their own breast cancer risk and the lack of clarity of the terms used in the survey, such as "ionizing radiation". Women in this age group noted that in the past, their health care

providers did not share with them the names of their prescribed contraceptive medications. Women in both age groups indicated that they did not mind being asked about their past medical conditions.

The focus group results could be used in clinical nursing practice to gain a better understanding of perceptions of breast cancer risk factors among younger and older African American women. This could lead to the development of culturally- and age- appropriate nursing interventions designed to address these perceptions in order to enhance the likelihood of adherence to recommended mammography screening guidelines. Perhaps an effective way to facilitate mammography screening would be to begin to address breast cancer risk factors among younger African American women, so that by the time they reach screening age, the risks and benefits of screening will be clear to them. A caveat is the fact that addressing knowledge of breast cancer risk factors alone is not likely to facilitate screening to as great an extent as would be found by addressing knowledge in addition to other barriers such as cost, transportation and child care. These factors may hinder adherence to breast cancer screening regardless of the extent to which women are aware of breast cancer risk.

The results of this study could also be used to inform developers of instruments designed to measure breast cancer risk among African American women. The differential responses of the younger women and the older women to the same breast cancer risk factor survey demonstrates the fact that surveys need to be both culturally appropriate and age appropriate for the population that is designated to complete the survey. It is also important to ensure that surveys are administered in the mode most acceptable to those who will complete the survey. Prior to conducting a survey, it would be helpful to discover whether potential respondents prefer mailed or telephone surveys or surveys administered face-to-face in their homes or at a central location.

Table 1. Breast Cancer Risk Factors

Women Aged 18-50 Years	Women Aged 50+ Years
In response to being asked to identify some breast cancer risk factors, the participants stated: ❑ "Environmental" ❑ "Family background" ❑ "Genetics" ❑ "How the family took care of their health"	In response to being asked to identify some breast cancer risk factors, the participants stated: ❑ "Heredity, diet" ❑ "Hormone replacement" ❑ "...if you have a history of breast cancer"

Table 2. Concerns About the Confidentiality of Survey Information Provided

Women Aged 18-50	Women Aged 50+
When asked how they would feel about receiving a mailed survey with pre-printed information about the participant, they stated: ❑ "Who's gonna get this information?" ❑ "You told me it's gonna be anonymous" ❑ "If it was an anonymous questionnaire, then how would you go about asking for contact information?" ❑ "Maybe if they just restated that this (contact information) would be separate and no one with the survey would know (which survey I completed)"	When asked how they would feel about receiving a mailed survey with pre-printed information about the participant, they stated: ❑ "I would have a problem. I wold wonder how someone would have access to my social security number" ❑ "I would be concerned"

Table 3. Cultural Relevance of Family History Questions

Women Aged 18-50	Women Aged 50+
In response to questions about family history of cancer, two respondents replied: ❑ "I wouldn't be able to answer the question, because (I don't know the) history of men around me. Like my mother's mother, I don't know about them. My father and his brothers, I don't know about them" ❑ "There are no men around my family. It's basically women, you know"	In response to questions about family history of cancer, respondents replied: ❑ "What if we don't know what our ancestors died from, because in the south it was like they just died. That's what they told us kids 'Grandma just died of old age'. Well...(she) might have had cancer but we'd never know. So we would just skip that (section of the survey)" ❑ "Yes, right here in the city of Detroit my great-grandmother died and on her death certificate it just says 'reasons related to old age' because she was eighty-eight"

Table 4. Difficulty Remembering Past Events

Women Aged 18-50	Women Aged 50+
In response to questions about menstruation history, the participants stated: ❑ "It's asking you how frequently you had menstrual periods during each decade. You can't be accurate with your answer...who kept an accurate record of their menstrual period?" ❑ Disagreement: "Some people record (their menstruation) each month" ❑ "I started keeping records and I think most women do"	In response to questions about menstruation history, a participant stated: ❑ "How many young people are going to take the time to mark a calendar ... to be able to answer this question? I mean, there are those who do, but I didn't"
In response to questions about contraceptive history, some women stated: ❑ "When you go that far back, how do you know what your birth control pills had in them? My birth control pills were taken off the market and I was issued a new brand"	In response to questions about contraceptive history, some women stated: ❑ "If they used an inter-uterine device they may not remember" ❑ "Yeah, (they may not remember) the proper name of it" ❑ "I don't remember any of the brands" ❑ "I do not remember" ❑ "I would have to skip that page" ❑ "This is a problem. This is a big problem" ❑ "And also, even if you remembered the brand, like Ortho-Novum, they have several different kinds"

Table 5. Relevance of Racial Identification Items

Women Aged 18-50	Women Aged 50+
When asked how comfortable they would feel in responding to the survey question "In which of the following categories would you classify yourself?", the participants stated: ❑ "It doesn't matter what I am. I'm American" ❑ "It just seems like every time I have to fill out something, they're asking it (racial identification)" ❑ "If there really is some relevance to getting this information, I might not have a problem with it, but generally I always wonder why … unless it was explained (why the racial identification information was needed)" ❑ "What difference does it make about my background?" ❑ "I feel it makes a difference… if you're trying to do a study on something medical or something cultural then it does matter what the ethnic group is" ❑ "I agree. I feel like some questions you need to answer when you find out what it's for" ❑ "When it asked 'what country are most of your father's ancestors from' my response was 'none of your business' but then I thought well, they need to know"	When asked how comfortable they would feel in responding to survey questions related to parent's country of origin and racial identity, the participants stated: ❑ "Why do you need to know what country your father's from? That's already been answered when you speak of the ancestry and the ethnic group questions" ❑ "What is the purpose of answering questions 5 and 6 (about country of origins of parent's ancestors) if you've already answered question 4 (about ethnic group with which the family household identifies)?" ❑ "To me, it's redundant" ❑ Disagreement: "It really isn't (redundant) ❑ "To us (Black women), it might be redundant but to another ethnic group this could be important" ❑ "Most of us come from a melting pot

Table 6. Themes Specific to Women in the Younger Age Group (Aged 18-50 Years)

Women Aged 18-50
Perceptions of Factors that Influence Risk of Breast Cancer When asked about factors related to breast cancer risk, the women stated: ❑ "I think diet and smoking" ❑ "Exercise" ❑ "This might be an old wives' tale but my grandmother said not wearing a bra (increases risk)" ❑ "Exposure to chemicals" ❑ "Sleeping in a bra with wire in it" ❑ "Lack of estrogen" ❑ "Sports bras" ❑ "Silicone implants" ❑ "Drugs" ❑ "Hormones" ❑ "Weight" ❑ "Breast density and fibroids" ❑ "Different combinations of prescribed medications"
Perceptions of Groups at Highest Risk of Breast Cancer In terms of their perception of groups at highest risk of developing breast cancer, the participant stated: ❑ "Black women" ❑ "People over age 40" ❑ "Those whose grandmothers or mothers had breast cancer"
Perceptions of Personal Risk of Breast Cancer In terms of their personal risk of developing breast cancer, participants stated: ❑ "My mother didn't get her first mammography until she was in her 50s. I say I'm at a lower risk because I started getting my baseline at an earlier age" ❑ "Since I'm diabetic, I do have a tendency to be cystic. I started getting my baselines at 35 and then had them every year. So there's a chance for me to have early detection, thereby a greater chance of survival" ❑ "I feel like I might be at a higher incidence. Breast cancer is not in my family but my body creates so many fibroids and I've had a couple of very bad scares"
Cultural Relevance of Exercise Questions Regarding the exercise questions, participants stated: ❑ "It should not specify tennis. It could have been gymnastics. It should be a little more general" ❑ "Yeah, like dodge ball" ❑ "Yeah, I never played tennis in elementary school. That's how ethnicity comes into play...you know, there's not tennis in our schools but there might have been in Caucasian schools" ❑ "Add an average something (type of exercise) that people do" ❑ "A lot of people do a lot of jogging" ❑ "Most schools have volleyball and baseball" ❑ "Not too many people play tennis. I know I never did"

Table 6. Themes Specific to Women in the Younger Age Group (Aged 18-50 Years) (cont'd)

Women Aged 18-50
Embarrassment In response to the survey questions related to exercise, a participant stated: ▫ "We would all feel good about this if we could say we did that (exercise)" In response to questions related to alcohol use, participants stated: ▫ "When you start filling out things like this.. about liquor and things, you might start feeling like... they might think I'm an alcoholic... I not sure how honest we would be" ▫ "I think for some individuals it would be a question of honesty. I don't think it's (data are) going to be very accurate" In response to questions related to tobacco use, a participant said: ▫ "I would have no problem with saying 'Have you ever dipped snuff or chewed tobacco?'" **Health Problems** A number of women indicated that they had experienced serious health problems: ▫ "I might not come on (my period) for two years and the next thing I know...the floodgates are open...then you might skip a week, then you might come on (menstruate)again" ▫ "So I kept records of it (menstruation) because I wanted to know how it (menstruation) came, so it came every three years" ▫ "I'm a cancer patient. I had breast cancer and cervical cancer so it's good to be here" ▫ "I had a hysterectomy" ▫ "I've already had a hysterectomy. I've already survived cancer" ▫ "I'm in renal surgery and I just started dialysis and that was my thing but ...it's not as bad as I thought" ▫ "I have an eye problem" ▫ "I've already had cancer so diabetes (is something) I'm not looking forward to" ▫ "If this (condition) continues to deteriorate, I might not be able to walk" **Pain** When asked during the icebreaker what their dream vacation would consist of, four of the women made the following statements: ▫ "A pain-free, two-week cruise" ▫ "A pain-free month in Barbados" ▫ "A pain-free paradise" ▫ "Someplace I won't be bothered with my asthma, endometriosis, and headaches" **Tobacco Use:** In response to questions related to tobacco use, two participants said: ▫ "You'd have to kind of go back and try to reflect (on how much you smoked in previous years)" ▫ Disagreement: "they're not asking for packs. They say 'How many years did you smoke?' That's an easier question

Table 7. Themes Specific to Women in the Older Age Group (Aged 50+ Years)

Women Aged 50+
Age/Cohort Effects In response to questions about the birth control methods they had used previously, participants stated: ▫ "Certain things (described in the survey) were not available to us. Like the Norplant came after I had babies" ▫ "There was a point in some of our lives where doctors told us not to use birth control pills if we were prone to cancer. I can't say that's the reason I had all those babies, but that's what was told to me" ▫ "Actually, our doctors never took time to tell us, 'Well your (medication) has this in it and this in it'" ▫ "No they just said 'Here'" ▫ "Here's your prescription" **Intergenerational Concerns** In response to the question related to names of previously used methods of contraception, a participant stated: ▫ "We may not have been told the proper name" In response to questions about menstruation and menopause history, a participant stated: ▫ "Is this (questionnaire) for a certain age group?" In response to the question about whether participants would complete the questionnaire, participants stated: ▫ "I would fill it out because it is a study of women and I have two daughters, which are young women now, and .... this study might help with (their) diagnosis (of a medical condition)" ▫ "I'd do it mainly because... as a group of black women, (we) tend not to do these things for various reasons. Since I've gone through menopause and talking to (my) girlfriends, we found out that we have a lot of similarities and a lot of differences also" ▫ "Some of the questions (on this questionnaire) had a direct barring on your life and for me, it would give me information that I could readily see..... I would make this part of my family (history) because (some of these health questions) may come up again" **Comfort in Completing "Menstruation and Menopause History" Items:** When asked how comfortable they would feel in completing this section of the survey, participants stated: ▫ "These are just normal questions dealing with females" ▫ "We've been asked these questions all our lives, every appointment, every doctor's office since we started (menstruating)" **Denial of Disease** In terms of denial of disease, two participants stated: ▫ "I've seen ladies that have had their breast removed and they will tell you they don't know if they have breast cancer" ▫ "Because they deny it" **Relevance of Items on Menstrual Flow** In terms of the relevance of these items to breast cancer risk, participants stated: ▫ "What would be the point of knowing the number of pads" ▫ "What would be the significance of asking that question?"

Reference List

Beaudin CL & Pelletier LR. (1996). Consumer-based research: using focus groups as a method for evaluating quality of care. Journal of Nursing Care Quality, 10, 28-33.

Blumer C. (1998). Clinical decisions: defining meaning through focus groups. Nursing Standard, 8, 34-26.

Chu KC, Baker SG, & Tarone RE. (1999). A method for identifying abrupt changes in U. S. cancer mortality trends. Cancer, 86, 157-169.

Chu, K., Tarone RE, & Brawley OH. (1999). Breast cancer trends of black women compared with white women. Archives of Family Medicine, 8, 521-528.

Earp, J.L., Altpeter, M., Mayne, L., Viadro, C.I., & O'Malley, M.S. (1995). The North Carolina Breast Cancer Screening Program: foundations and design of a model for reaching older, minority, rural women. Breast Cancer Research and Treatment, 35(1), 7-22.

Gorey, K., Holowatty EJ, Gehringer G, Laukkanen, E., Moskowitz, A., Webster, D., & Richter, N. (1997). A international comparison of cancer survival: Toronto, Ontario, and Detroit, Michigan. American Journal of Public Health, 87, 1156-1163.

Howard, D., Penchansky, R., & Brown, M. (1998). Desegregating the effects of race on breast cancer survival. Family Medicine, 30, 228-229.

Kohler, C.L., Dolce, J.J., Manzella, B.A., Higgins, D., Brooks, C.M., Richards, J.M., & Bailey, C. (1993). Use of focus group methodology to develop an asthma self-management program useful for community-based medical practices. Health Education Quarterly, 20, 421-429.

McCarthy, B.D., Ulcickas, Y.M., Boohaker, E.A., Ward, R., Rebner, M., & Johnson, C.C. (1996). Inadequate follow-up of abnormal mammograms. American Journal of Preventive Medicine, 12, 282-288.

McCarthy, B.D., Yood, M.U., Janz, N.K., Boohaker, E.A., Ward, R.E., & Johnson, C.C. (1996). Evaluation of factors potentially associated with inadequate follow-up of mammographic abnormalities. Cancer, 77(10), 2070-2076.

Nymanthi A, & Shuler , P. (1990). Focus group interview: a research technique for informed nursing practice. Journal of Advanced Nursing, 15, 1281-1288.

Pearlman, D.N., Rakowski, W., Ehrich, B., & Clark, M.A. (1996). Breast cancer screening practices among black, Hispanic, and white women: reassessing differences. Am J Prev. Med., 12(5), 327-337.

Philips JM, Cohen, M., & Moses, G. (1999). Breast cancer screening and African American women: fear fatalism, and silence. Oncology Nursing Forum, 26, 561-571.

Roberson, N.L. (1994). Breast cancer screening in older Black women. Cancer, 74, 2034-2041.

Sim, J. (1998). Collecting and analyzing qualitative data: issues raised by the focus group. Journal of Advanced Nursing, 28, 345-352.

Stein, J.A., Fox, S.A., Murata, P.J., & Morisky, D.E. (1992). Mammography usage and the health belief model. Health Education Quarterly, 19(4), 447-462.

Thom, D., & Campbell, B. (1997). Patient -physician trust: an exploratory study. Journal of Family Practice, 44, 169-176.

Thomas, S., & Flick, A. (1995). Women's health part ii: individual, environmental, and economic factors affecting adherence to recommended screening practices for breast cancer. Journal of Louisiana State Medical Society, 147, 149-155.

Womeodu, R., & Bailey, J. (1996). Barriers to cancer screening. Medical Clinics of North America, 80, 115-133.

Wu LY, Semenya KA, Hardy RE, Hargreaves MK, Robinson DB, Pederson L, Sung JF, & Haynes MA. (1998). Cancer rate differentials between blacks and whites in three metropolitan areas: a 10-year comparison. Journal of the National Medical Association, 90(7), 410-416.

Yancey, A., Tanjasiri, S., Klein, M., & Tunder, J. (1995). Increased cancer screening behavior in women of color by culturally sensitive video exposure. Preventive Medicine, 24, 142-148.

Race and Differences in Breast Cancer Survival in a Managed Care Population

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Background: African-American women with breast cancer have poorer survival than European-American women. After adjustment for socioeconomic variables, survival differences diminish but do not disappear, possibly because of residual differences in health care access, biology, or behavior. This study compared breast cancer survival in African-American and European-American women with similar health care access. *Methods:* We measured survival in women with breast cancer who are served by a large medical group and a metropolitan Detroit health maintenance organization where screening, diagnosis, treatment, and follow-up are based on standard practices and mammography is a covered benefit. We abstracted data on African-American and European-American women who had been diagnosed with breast cancer from January 1986 through April 1996 (n = 886) and followed these women for survival through April 1997 (137 deaths). *Results:* African-American women were diagnosed at a later stage than were European-American women. Median follow-up was 50 months. Five-year survival was 77% for African-American and 84% for European-American women. The crude hazard ratio for African-American women relative to European-American women was 1.6 (95% confidence interval [CI] = 1.1–2.2). Adjusting only for stage, the hazard ratio was 1.3 (95% CI = 0.9–1.9). Adjusting only for sociodemographic factors (age, marital status, and income), the hazard ratio was 1.2 (95% CI = 0.8–1.9). After adjusting for age, marital status, income, and stage, the hazard ratio was 1.0 (95% CI = 0.7–1.5). *Conclusion:* Among women with similar medical care access since before their diagnoses, we found ethnic differences in stage of breast cancer at diagnosis. Adjustment for this difference and for income, age, and marital status resulted in a negligible effect of race on survival. [J Natl Cancer Inst 1999;91: 1487–91]

In the United States, survival for African-American women with breast cancer is inferior to that for European-American women *(1)*. The 1970s and 1980s marked a time of relatively stable rates of mortality among European-American women with breast cancer but of increasing rates for African-American women *(1)*. The decline in mortality observed in the early 1990s for European-American women with breast cancer was not observed in African-American women *(1,2)*. Poorer survival among African-Americans has been attributed to biologic characteristics of the tumor, advanced stage at diagnosis, lower socioeconomic status (SES), barriers to health care, diagnostic and treatment delays *(3,4)*, and a higher prevalence of comorbid conditions *(5,6)*. Although use of mammography by African-American women has been reported to lag behind use by Caucasian women *(7)*, research *(8)* indicates that this racial discrepancy is narrowing. However, it is too soon to see how increased use of mammography among African-American women will affect survival.

Most investigations *(9–11)* have found differences in tumor stage at disease presentation across ethnic groups. Use of multivariate models to control for biologic differences and sociodemographic characteristics has usually reduced but not eliminated the racial differential in survival *(6,12–15)*. Many investigators *(16–19)* have attributed the mortality differences primarily to racial disparity in SES, by way of its influence on diagnostic delays or even a lag in benefiting from medical advances *(20)*. Others *(6,9,10)* have perceived an important role for intrinsic differences in tumor aggressiveness.

We present analyses of breast cancer survival in a population of health maintenance organization (HMO) members where screening, diagnosis, treatment, and follow-up patterns are based on practice standards and are similar for all members of the population served within a large, multidisciplinary group practice. We selected this population to minimize heterogeneity in care delivery and to minimize financial barriers to health care.

Methods

Setting

The setting for this study was the Health Alliance Plan (HAP) HMO. HAP is located in southeastern Michigan and is the largest HMO in Michigan, with more than 450 000 members. Approximately 20% of these members are African-American, 53% are female, and 57% are cared for by physicians in the Henry Ford Medical Group (HFMG). Our study population was drawn from HAP members served by the HFMG. The HFMG is a large group practice that includes an urban medical center in Detroit with primary and specialty care clinics and 26 smaller clinics throughout urban and suburban southeastern Michigan.

The HFMG maintains a computerized tumor registry database accredited by the American College of Surgeons. Registry staff use a thorough case-finding system, including review of all pathology and cytology reports, as well as radiation and oncology consultations. The American Joint Commission on Cancer staging system *(21)*—called "TNM staging"—is used to determine the stage of disease by evaluating tumor size, extent of invasion, microscopic involvement of lymph nodes, and presence of metastases. HFMG registry staff link these data with Detroit area Surveillance, Epidemiology, and End Results (SEER)[1] Program records and conduct annual follow-up for vital status and recurrence. Follow-up information is complete for 94% of the women in the tumor registry.

Ascertainment of Case Patients

By use of the HFMG cancer registry, we identified all African-American and European-American women with incident breast cancer first diagnosed from January 1986 through April 1996. To minimize heterogeneity in clinical practice and access to care just before diagnosis, we limited the study population to women continuously enrolled in HAP for at least 1 year before diagnosis and assigned to a primary care physician within the HFMG at the time of diagnosis. We defined continuous enrollment as no

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See "Notes" following "References."

more than a 60-day gap in coverage according to membership files.

Outcome Data

We used several sources to identify follow-up data. First, we obtained vital status, date of death (if applicable), and date last known alive from the HFMG tumor registry. Next, for those women thought to be alive, we used HFMG administrative billing data to obtain information about hospitalizations and outpatient visits from January 1986 through April 1997. We used the billing data to update the tumor registry date where appropriate.

Identification of Related Variables

By use of the tumor registry, we obtained information on tumor characteristics, date of diagnosis, pathologic stage at diagnosis (including tumor size), and demographic factors (race, date of birth, and marital status). The demographic variables were primarily obtained from a self-administered questionnaire completed by new patients. We geocoded addresses from billing files into census block groups. We estimated household income for each woman by use of block group level median household income from the 1990 census data. Information about duration of HAP membership and mammography benefits was downloaded from the HMO membership files.

Statistical Methods

To evaluate the association between stage and race, we fit a multinomial logistic model in which we included pathologic stage (0, I, II, III, or IV) as the dependent variable and race (European-American or African-American) as the independent variable. We compared survival between African-American and European-American women by use of the hazard ratio and 95% confidence interval (CI) calculated from Cox proportional hazards models. In the model, we included marital status (unmarried or married), age at diagnosis (<55 years or ≥55 years [corresponding to the mean of this dataset]), estimated household income (<$35 000 or ≥$35 000 [likewise, the mean]), and pathologic stage (0, I, II, III, or IV) as indicator terms. Age of less than 55 years, married, income below $35 000, and stage II disease were the reference categories used in the adjusted model (because they included the largest number of women). All variables included in the model were chosen on the basis of known relationships with both breast cancer survival and race (i.e., as potential confounders). The assumption of proportional hazards was assessed graphically and by use of Schoenfeld's χ^2 goodness-of-fit procedures (*22*).

We considered the possibility that our method of updating the tumor registry's "date last known alive" with visit data would bias our estimates of survival if one ethnic group were more likely to have contact with the HFMG following diagnosis. Therefore, we conducted the analysis twice: First, we included only tumor registry follow-up dates; second, we used the billing data in addition. Differences between the two approaches were found to be negligible; therefore, analyses including the updated data are used in this report.

Results

We identified 1321 African-American and European-American women members of HAP who were diagnosed with breast cancer from January 1986 through April 1996 and for whom mammography was a fully covered benefit. From this group, we excluded 161 women because they were not assigned to HFMG physicians at the time of diagnosis and an additional 274 women because they were not continuously enrolled in HAP for 1 year before diagnosis, for a final sample of 886 women. The proportion of African-Americans (30%) was the same among the women excluded and the study group.

The median follow-up time was 50 months overall and was similar for African-American (49 months) and European-American (50 months) women who were alive at the end of follow-up. A total of 137 deaths occurred during the study period. Table 1 shows the baseline demographic and tumor-specific characteristics of the study population. The multinomial logistic model indicated that European-American women were more likely to have earlier stage disease at diagnosis than were African-American women. When we examined this issue more closely, European-Americans were more likely than African-Americans to have disease of an earlier stage (0 or I), with an absolute difference of 11% (95% CI = 3%–18%). Among women diagnosed with stage II disease (which includes cancers with and without lymph node involvement), we found no material difference between African-American and European-American women in the proportions with positive lymph nodes (difference = 5%; 95% CI = −6% to 17%).

The 5-year survival was 77% for African-Americans and 84% for European-Americans. The crude estimates by race are shown in Fig. 1. African-American women had poorer survival compared with European-American women (hazard ratio = 1.6; 95% CI = 1.1–2.2). Table 2 presents the hazard ratios adjusted for pathologic stage and sociodemographic factors, separately and in combination. When stage was added to the model, the hazard ratio decreased to 1.3 (95% CI = 0.9–1.9). Adjusting only for sociodemographic factors, the hazard ratio was re-

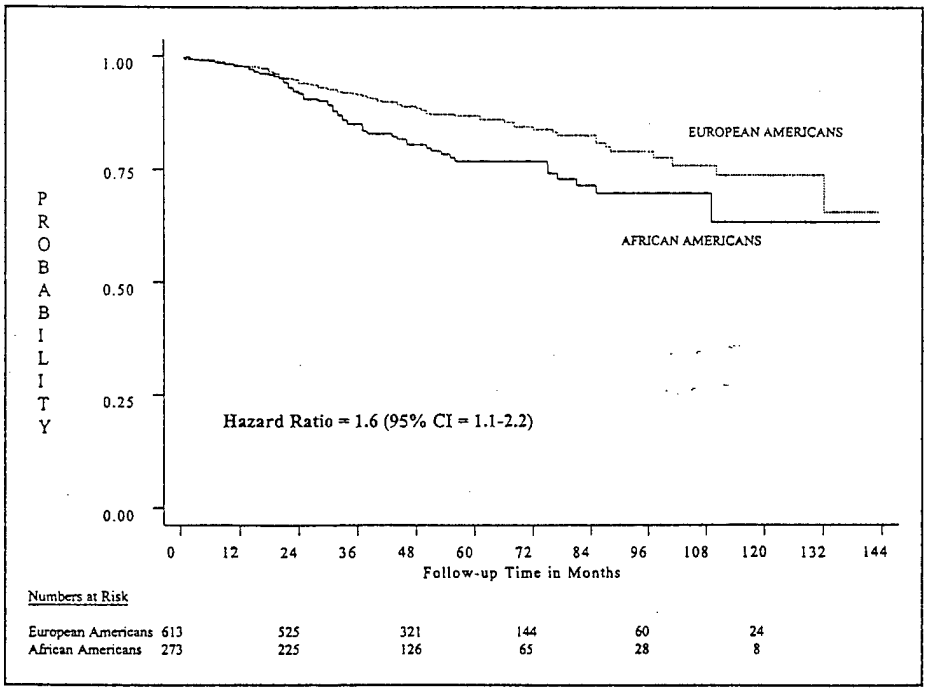

Fig. 1. Crude Kaplan–Meier survival estimates, by race. For the 886 African-American and European-American women with breast cancer who were seen at the Health Alliance Plan–Henry Ford Medical Group from January 1986 through April 1996, the cumulative survival proportion at 36 months of follow-up was 0.85 (95% confidence interval [CI] = 0.80–0.89) and 0.92 (95% CI = 0.89–0.94) for European-Americans; at 72 months, the cumulative survival was 0.77 (95% CI = 0.70–0.82) for African-Americans and 0.84 (95% CI = 0.80–0.87) for European-Americans; at 108 months, the cumulative survival was 0.70 (95% CI = 0.61–0.77) for African-Americans and 0.76 (95% CI = 0.68–0.82) for European-Americans. The table below the *x*-axis shows the numbers of patients at risk at representative time points. Symbols used: ----- = European-American; —— = African-American

duced to 1.2 (95% CI = 0.8–1.9). When we controlled for both stage and sociodemographics, the hazard ratio was reduced to 1.0 (95% CI = 0.7–1.5). The survival curves by race, adjusted for sociodemographic characteristics and stage, are shown in Fig. 2 and reflect this equivalent survival pattern. There was no evidence of violation of the proportional hazards assumption in the adjusted model.

Discussion

It is well-known that survival after breast cancer diagnosis is poorer for African-American women than for European-American women *(1–3,6,13–15,17,19)*. It is difficult to summarize the pertinent literature because no two studies are precisely comparable, and many papers are quoted differently by the authors who cite them. Nevertheless, some valid generalizations are relevant here. As we found, the difference in distribution of stage at detection has a major influence on differential African-American/European-American survival but does not fully explain it *(6,10–15)*.

By studying only HAP–HFMG patients, we eliminated the issue of lack of insurance coverage for screening and diagnostic services, a factor associated with both later stage at diagnosis and lower SES *(4,6,15,23)*. Even within this equal-coverage population, with its relative homogeneity of health care access and delivery, a large discrepancy in stage remains between African-American and European-American women (Table 1). Our study was not designed to investigate reasons for differences in stage at detection such as mammography use. However, two existing studies, both conducted in HAP–HFMG populations during approximately the same time period as this study, shed some light on this question. These studies measured, respectively, the proportion of women more than 50 years old who received mammography according to guidelines (relatively, 5.6% fewer African-American than European-American women) *(24)* and the proportion of women more than 50 years old with normal screening mammograms who were screened again within 2 years (relatively, 7.2% fewer African-American than European-American women) *(25)*. These small racial differences in mammography use among women in the same health care system as our sample have two implications: 1) The differences in mammography use are probably too small to explain the racial differences in stage at detection (relatively, 19% fewer African-American women with stage 0 or I disease; Tables 1 and 2) as implied above, uniform insurance coverage and clinical practices are not sufficient to equalize completely African-American and European-American women's use of breast cancer screening services.

Use of health care influences stage at diagnosis and the effectiveness of treatment *(4,11,23)*. The difficulty of obtaining data on populations with even approximate uniformity of care motivates our study. Its detailed results cannot be generalized to different populations or regions, but it constitutes an important addition to the body of work that greatly reduces the influence of race on survival by adjusting for stage and SES.

Wojcik et al. *(26)* eliminated the insurance factor by studying women cared for in the Department of Defense system, which also tries to provide equal access. The authors found that, among women with breast cancer, after adjustment for age and stage, European-American women had better survival than African-American women; however, Wojcik et al. did not control for income, a factor that varied by race in our sample of HMO members.

In our population, sociodemographic variables and stage, taken separately, had comparable confounding effects on the association between race and survival. As noted by Weiss et al. *(27)* and illustrated in the literature that we cite, SES is difficult to quantify and consists of a constellation of factors, although income plays a primary role. We know of one study besides our own that employs census data at the block group level *(28)* to improve the precision of SES estimates. Bassett and Krieger *(16)* do this by using six measures of SES other than income, and they adjust for age and stage. However, they did not study a sample with equivalent health care coverage. Both our study and that of Bassett and Krieger *(16)* come very close to eliminating race as an independent influence on survival.

The results of our study indicate that factors other than the ability to pay for services affect breast cancer survival. These factors may have some influence on stage at detection in particular. They include various beliefs about cancer risk and the usefulness of early detection, differences in the effects of various outreach and reminder strategies, differences in access mediated by transportation or the ability to get time off from work to keep appointments, obesity, comorbidities, and

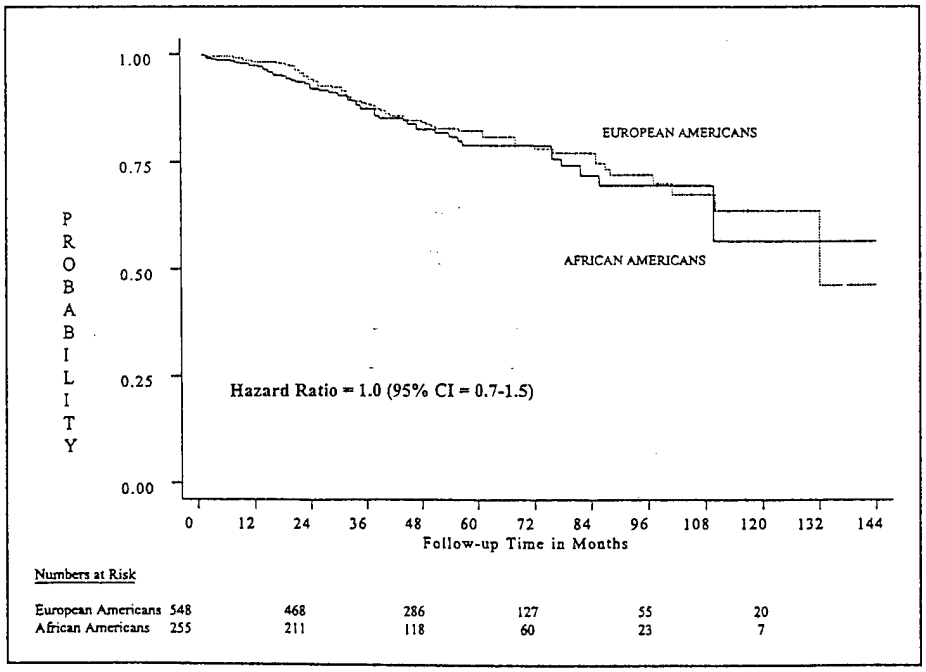

Fig. 2. Survival by race, adjusted for age, income, marital status, and stage. Adjusted Kaplan–Meier curves for 886 women with breast cancer seen at the Health Alliance Plan–Henry Ford Medical Group from January 1986 through April 1996. The table under the *x*-axis gives the numbers of patients at risk at representative time points. CI = confidence interval. Symbols used: ------- = European-American; —— = African-American.

Table 1. Baseline demographic and tumor characteristics*

	Value (95% CI)	
	African-American (n = 273)	European-American (n = 613)
Sociodemographics†		
Married	54% (48%–60%)	59% (65%–73%)
Mean age in y at diagnosis	55 (54–57)	56 (55–57)
Median household income ($1000)	26 (24–27)	44 (42–45)
Mean HMO enrollment before diagnosis, y	6.9 (6.3–7.5)	5.4 (5.1–5.7)
Tumor characteristics		
Stage‡		
∅	17% (13%–22%)	21% (17%–24%)
I	29% (24%–34%)	36% (32%–40%)
II	40% (34%–46%)	33% (29%–37%)
III	9% (5%–12%)	7% (5%–12%)
IV	5% (2%–8%)	3% (1%–4%)
Mean tumor size, cm	2.4 (2.1–2.6)	2.1 (2.0–2.3)

*CI = confidence interval; HMO = health maintenance organization.

†Marital status missing for five African-American and eight European-American women. Median household income missing for 13 African-American and 56 European-American women. Both marital status and median income missing for one European-American woman.

‡Stage according to the American Joint Commission on Cancer system *(21)*.

Table 2. Effect of demographic and tumor characteristics on survival estimates

Variables in model	Hazard ratio, African-American versus European-American	95% confidence interval
Race only	1.6	1.1–2.2
Race + stage*	1.3	0.9–1.9
Race + sociodemographic factors†	1.2	0.8–1.9
Race + stage + sociodemographic factors†	1.0	0.7–1.5

*Stage according to the American Joint Commission on Cancer system *(21)*.

†Age, marital status, and median household income.

differences in breast density that modify the effectiveness of mammograms *(4,11, 23,29–33)*.

A fundamental question for us, and for the related studies we cite, is whether African-American women have intrinsically more aggressive tumors than European-American women, thus affecting their survival either directly or by way of stage at detection because of more rapid progression. Our study did not incorporate estrogen receptor status or histologic tumor grade because they were often omitted from the HFMG tumor registry and, when available, had not been evaluated consistently.

The literature can be roughly divided into studies that find intrinsic differences in tumor aggressiveness (higher nuclear and histologic grade, S-phase fraction or mitotic index, and estrogen receptor negativity) to exercise a major influence on differential African-American/European-American survival *(6,9,10)*, and the greater number that find no positive evidence for this effect because they attribute a very limited influence to race after adjustment for stage and SES *(15–20)*. In a population with uniform health care coverage, we found that the residual influence of race after adjustment is negligible (hazard ratio = 1.0; 95% CI = 0.7–1.5). This result lends support to the view that the effect of an intrinsic difference in tumor biology (if any) must be small and exercised mainly through its influence on stage at diagnosis.

References

(1) Chevarley F, White E. Recent trends in breast cancer mortality among white and black US women. Am J Public Health 1997;87:775–81.

(2) Wingo PA, Ries LA, Rosenberg HM, Miller DS, Edwards BK. Cancer incidence and mortality, 1973–1995: a report card for the U.S. Cancer 1998;82:1197–207.

(3) Bain RP, Greenberg RS, Whitaker JP. Racial differences in survival of women with breast cancer. J Chronic Dis 1986;39:631–42.

(4) Hunter CP, Redmond CK, Chen VW, Austin DF, Greenberg RS, Correa P, et al. Breast cancer: factors associated with stage at diagnosis in black and white women. Black/White Cancer Survival Study Group. J Natl Cancer Inst 1993;85:1129–37.

(5) West DW, Satariano WA, Ragland DR, Hiatt RA. Comorbidity and breast cancer survival: a comparison between black and white women. Ann Epidemiol 1996;6:413–9.

(6) Eley JW, Hill HA, Chen VW, Austin DF, Wesley MN, Muss HB, et al. Racial differences in survival from breast cancer. JAMA 1994;272: 947–54.

(7) Burns RB, McCarthy EP, Freund KM, Marwill SL, Shwartz M, Ash A, et al. Black women receive less mammography even with similar use of primary care. Ann Intern Med 1996;125: 173–82.

(8) Anderson LM, May DS. Has the use of cervical, breast, and colorectal cancer screening increased in the United States? Am J Public Health 1995;85:840–2.

(9) Chen VW, Correa P, Kurman RJ, Wu XC, Eley JW, Austin D, et al. Histological characteristics of breast carcinoma in blacks and whites. Cancer Epidemiol Biomarkers Prev 1994;3: 127–35.

(10) Elledge RM, Clark GM, Chamness GC, Osborne CK. Tumor biologic factors and breast cancer prognosis among white, Hispanic, and black women in the United States. J Natl Cancer Inst 1994;86:705–12.

(11) Moormeier J. Breast cancer in black women. Ann Intern Med 1996;124:897–905.

(12) Vernon SW, Tilley BC, Neale AV, Steinfeldt L. Ethnicity, survival, and delay in seeking treatment for symptoms of breast cancer. Cancer 1985;55:1563–71.

(13) Simon MS, Severson RK. Racial differences in survival of female breast cancer in the Detroit metropolitan area. Cancer 1996;77:308–14.

(14) Simon MS, Severson RK. Racial differences in breast cancer survival: the interaction of socioeconomic status and tumor biology. Am J Obstet Gynecol 1997;176:S233–9.

(15) Perkins P, Cooksley CD, Cox JD. Breast cancer. Is ethnicity an independent prognostic factor for survival? Cancer 1996;78: 1241–7.

(16) Bassett MT, Krieger N. Social class and black–white differences in breast cancer survival. Am J Public Health 1986;76:1400–3.

(17) Dayal HH, Power RN, Chiu C. Race and socioeconomic status in survival from breast cancer. J Chronic Dis 1982;35:675–83.

(18) Gordon NH, Crowe JP, Brumberg DJ, Berger NA. Socioeconomic factors and race in breast cancer recurrence and survival. Am J Epidemiol 1992;135:609–18.

(19) Ansell D, Whitman S, Lipton R, Cooper R. Race, income, and survival from breast cancer at two public hospitals. Cancer 1993;72: 2974–8.

(20) Heimann R, Ferguson D, Powers C, Suri D, Weichselbaum RR, Hellman S. Race and clinical outcome in breast cancer in a series with long-term follow-up evaluation. J Clin Oncol 1997;15:2329–37.

(21) American Joint Commission on Cancer. AJCC cancer staging manual. 5th ed. Philadelphia (PA): Lippincott-Raven; 1997.

(22) Schoenfeld D. Chi-squared goodness-of-fit tests for the proportional hazards regression model. Biometrika 1980;67:145–53.

(23) Lannin DR, Mathews HF, Mitchell J, Swanson MS, Swanson FH, Edwards MS. Influence of

socioeconomic and cultural factors on racial differences in late-stage presentation of breast cancer. JAMA 1998;279:1801–7.
(24) McCarthy BD, Yood MU, MacWilliam CH, Lee MJ. Screening mammography use: the importance of a population perspective. Am J Prev Med 1996;12:91–5.
(25) Yood MU, McCarthy BD, Lee NC, Jacobsen G, Johnson CC. Patterns and characteristics of repeat mammography among women 50 years and older. Cancer Epidemiol Biomarkers Prev 1999;8:595–9.
(26) Wojcik BE, Spinks MK, Optenberg SA. Breast carcinoma survival analysis for African-American and white women in an equal-access health care system. Cancer 1998;82: 1310–8.
(27) Weiss LK, Severson RK, Swanson GM. Issues in comparing survival rates for Detroit and Toronto [letter]. Am J Public Health 1998;88: 1556–7.
(28) Krieger N. Overcoming the absence of socioeconomic data in medical records: validation and application of a census-based methodology. Am J Public Health 1992;82:703–10.
(29) Lowe JI, Barg FK, Bernstein MW. Educating African-Americans about cancer prevention and detection: a review of the literature. Soc Work Health Care 1995;21:17–36.
(30) Lacey L. Cancer prevention and early detection strategies for reaching underserved urban, low-income black women. Barriers and objectives. Cancer 1993;72(3 Suppl):1078–83.
(31) Robinson RG, Kessler LG, Naughton MD. Cancer awareness among African-Americans: a survey assessing race, social status, and occupation. J Natl Med Assoc 1991;83:491–7.
(32) Price JH, Desmond SM, Wallace M, Smith D, Stewart PW. Black Americans' perceptions of cancer. A study utilizing the Health Belief Model. J Natl Med Assoc 1988;80: 1297–304.
(33) White E, Velentgas P, Mandelson MT, Lehman CD, Elmore JG, Porter P, et al. Variation in mammographic breast density by time in menstrual cycle among women aged 40–49 years. J Natl Cancer Inst 1998;90:906–10.

NOTES

[1]*Editor's note:* SEER is a set of geographically defined, population-based, central cancer registries in the United States, operated by local nonprofit organizations under contract to the National Cancer Institute (NCI). Registry data are submitted electronically without personal identifiers to the NCI on a biannual basis and the NCI makes the data available to the public for scientific research.

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Patterns and Characteristics of Repeat Mammography among Women 50 Years and Older[1]

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Abstract

Whereas efforts encouraging women to obtain initial mammograms are laudable, the importance of returning for subsequent routine mammograms cannot be minimized. The purpose of this study was to measure the timing, patterns, and characteristics of repeat screening mammography over time in a defined population of health maintenance organization members for whom mammography was a fully covered benefit. We identified all women ages 50–74 years who were enrolled in a southeastern Michigan health maintenance organization, assigned to a large medical group, and received at least one screening mammogram with a normal result between January 1, 1989 and December 31, 1996. Using administrative and radiology data, we calculated the proportion of women who received a subsequent mammogram within 2 years and the time to subsequent screening, both overall and stratified by demographic characteristics. We also examined screening patterns over a 5-year period. Of the 8749 women included in this study, 66.0% [95% confidence interval (CI), 65.0–67.0%] were subsequently screened within 2 years. We found slightly higher rates among Caucasians and married women. The proportion of women who received repeat mammography increased with estimated household income [9.5% difference between the highest and lowest categories (95% CI, 6.5–12.5%)]. The median time to subsequent screening was 17.7 months, and the probability of repeat screening was higher for women whose initial mammogram was between January 1992 and December 1994 compared to those receiving an initial mammogram between January 1989 and December 1991 (9.6% difference; 95% CI, 7.5–11.7%). Repeat mammography has improved over time; however, socioeconomic status could contribute to longer-than-intended intervals between screening when translated into real-world clinical practice. In a setting where most physicians recommended annual screening, we found that the median time to subsequent screening was delayed by 6 months. If annual mammography is the goal, recommendations should be made with the understanding of how the timing of repeat screening occurs in clinical practice.

Introduction

The United States Preventive Services Task Force recommends routine screening for breast cancer (mammography alone or in combination with clinical breast examination) every 1–2 years for women ages 50–69 years (1), and the American Cancer Society recommends annual screening for women in this age group (2). In the clinical setting, although physicians and patients may try to adhere to specific guidelines, subsequent screening usually takes place within a window around that targeted goal. Information about the timing of repeat screening can be used to create recommendations that achieve the clinical goal and acknowledge that most subsequent screening will not take place strictly within the guidelines. Furthermore, understanding whether certain subgroups are less likely to receive timely repeat screening, particularly in a setting where the cost of screening is not a barrier to a woman or her physician, could facilitate the development of implementation strategies. To our knowledge, no study has examined the timing of repeat mammography in a multiethnic population. The purpose of this study is to measure the patterns and characteristics of repeat screening mammography over time in a defined population of HMO[3] members for whom the mammography guideline frequency was every 1–2 years and physicians recommended annual mammography.

Materials and Methods

We used radiology, billing, and other administrative data to identify a cohort of female HMO members who had undergone at least one screening mammogram. We then used these data to describe and compare the patterns and characteristics of repeat screening (after the initial screening mammogram) in this cohort.

Setting

HAP, the largest HMO in Michigan, has approximately 525,000 members. HAP has a network of 46 medical centers

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[3] The abbreviations used are: HMO, health maintenance organization; HAP, Health Alliance Plan; HFMG, Henry Ford Medical Group; CI, confidence interval.

and 2,100 physicians associated with 18 hospitals. Approximately 57% of HAP members receive their care from physicians in the HFMG. Conversely, HAP members represent approximately 50% of the patients cared for by HFMG physicians.

The HFMG is a large, multispecialty group practice that consists of a hospital-based ambulatory care clinic in a large urban teaching hospital in Detroit (Henry Ford Hospital) and 26 satellite ambulatory care centers throughout southeastern Michigan. The hospital-based clinic and ambulatory sites are divided into six geographic regions for administrative purposes. We obtained the study population (see below) from women who were members of HAP and received at least one mammogram while under the care of a HFMG physician during the study period. Among the six regions in the HFMG, one region has a semiautonomous administrative, billing, and database structure; we excluded women assigned to this region.

Collection of Mammogram Data

All information about receipt of mammography came from two sources: (*a*) the HFMG radiology database; and (*b*) the HAP claims database (which records any patient billing activity outside HFMG).

HFMG Radiology Database. Mammography data from January 1, 1989 through May 30, 1992 were collected in the HFMG Department of Radiology, using a semistructured format. When the radiologists interpreted the film, they coded "track" in the database for all mammograms that required further follow-up. These "tracked" mammograms included screening mammograms that had an abnormal result and all diagnostic mammograms, regardless of the result. In this radiology database, the reason for the mammogram and the interpretation were recorded as free text.

Trained medical record abstractors used a structured abstracting form and reviewed the mammogram reports for all films classified as "track" during the study period. Using this information, we classified tracked mammograms as screening or diagnostic. Repeat abstraction of a sample of the reports showed that this process was highly reliable. Therefore, all screening mammograms during this time could be identified.

On June 1, 1992, the HFMG radiologists began interpreting and recording mammogram data in a highly structured format that included categorizing the indication for the mammograms, thereby providing easy identification of screening mammograms.

HAP Claims Data. We used HAP claims data to capture mammograms that occurred outside the HFMG. From these data, we could identify the location and dates of the mammogram; however, it was not possible to separate screening mammograms from nonscreening mammograms.

Identification of Study Cohort

We identified all women ages 50–74 years who were enrolled in HAP between January 1, 1989 and December 31, 1996 and who received at least one screening mammogram with a normal result at a HFMG site during the study period. For women who received more than one mammogram at a HFMG site within the study period, we randomly selected an index mammogram (reference mammogram from which subsequent screening was measured). We then limited the cohort to women who were enrolled continuously in HAP for at least 2 years after the index mammogram (to provide sufficient time for follow-up of subsequent screening) and who received mammography as a fully covered benefit. If a woman had two distinct enrollment intervals during the study period, we chose the longest continuous interval for the study. We excluded women who had only received mammograms outside the HFMG because we could not determine whether any of these mammograms were (as required for inclusion) for screening purposes.

For each member of the study population, we obtained race, marital status, date of birth, and zip code from the HFMG master patient index. This database contains information on all patients cared for by physicians in the HFMG.

Classification of Subsequent Mammograms

To identify subsequent mammogram patterns, any mammogram that occurred at least 9 months after the index screening mammogram was considered subsequent screening in this study. We used this classification scheme for all repeat mammograms, regardless of whether the subsequent mammogram was coded as screening in the database. This approach was selected for two reasons: (*a*) data on whether a mammogram was for screening or diagnostic purposes was not available from the HAP claims data (*i.e.*, mammograms received outside HFMG); and (*b*) a woman who had followed-up appropriately for annual screening but had an abnormality found on breast physical examination would have this follow-up mammogram coded as nonscreening (although the woman clearly followed-up with the screening process). We presumed that any mammograms received within 9 months after a screening mammogram were for nonscreening purposes and excluded these women from the analysis.

Statistical Analysis

Proportion of Women Subsequently Screened. To measure compliance with the United States Preventive Services Task Force screening guidelines, we calculated the proportion of women who received a subsequent mammogram within 2 years after the index screening mammogram. We also calculated these proportions and 95% CIs stratified by race (African American, Caucasian, and other), marital status (married or not married), age (in years; 50–54, 55–59, 60–64, and 65+), median household income based on zip code and United States census data (in dollars; 0–25,399, 25,400–38,099, and 38,100+), and timing of index mammogram (January 1989 through December 1991 and January 1992 through December 1994).

Subsequent Mammograms as a Function of Time. We used Kaplan-Meier estimates to measure the time from index mammogram to the subsequent mammogram. Women without a subsequent mammogram were censored at the end of the HAP enrollment period (for members who left the plan) or at the end of the study period (December 31, 1996), whichever came first. We stratified all analyses by race, marital status, age, median household income based on zip code and United States census data, and the timing of the index mammogram.

To measure the independent effect of race, marital status, age, income, and the timing of the index mammogram, we fit a multivariable proportional hazards model. We found no material differences between the crude and adjusted effect estimates; therefore, we present crude effect estimates in this study.

Subsequent Mammograms over a 5-Year Period. To measure the cumulative number of subsequent mammograms that occurred at least 9 months after the index mammogram over an extended period, we limited the population to women continuously enrolled in HAP for at least 5 years after the index mammogram.

Table 1 Frequency of repeat screening mammography by demographic characteristics (n = 8749 women)

Characteristic	Received subsequent screening within 2 years of index mammogram		
	n	%	Difference in percentages, compared to baseline (95% CI)[a]
Overall	5772	66.0	—
Race[b]			
Caucasian	4332	67.0	—
African American	1135	62.2	−4.8 (−7.3 to −2.3)
Other	115	64.6	2.4 (−4.7 to 9.5)
Age (yrs)			
50–54	1759	65.9	—
55–59	1358	67.2	1.3 (−1.4 to 4.0)
60–64	1181	66.8	0.9 (−1.9 to 3.7)
65+	1474	64.3	−1.6 (−4.3 to 1.1)
Married[c]			
Yes	4144	67.8	—
No	1538	61.9	−5.9 (−8.1 to −3.7)
Median income ($)[d]			
0–25,399	875	59.1	—
25,400–38,099	1518	64.4	5.3 (2.1–8.5)
38,100+	2051	68.6	9.5 (6.5–12.5)
Timing of index mammogram			
1/89–12/91	1884	59.8	—
1/92–12/94	3888	69.4	9.6 (7.5–11.7)

[a] Baseline category indicated by —.
[b] Race was unknown for 276 women.
[c] Marital status was unknown for 149 women.
[d] Income based on 1990 census data. Zip code of residence was unknown for 1919 women.

Results

Proportion of Women Subsequently Screened. We identified 9017 women who met the eligibility criteria for the study. From this group, we excluded 268 women because they received a second mammogram within 9 months of the index screening mammogram, leaving a final sample of 8749 women. The percentages of women who received a subsequent mammogram within 2 years by demographic characteristics are shown in Table 1. The overall percentage of women receiving subsequent mammograms within 2 years was 66.0% (95% CI, 65.0–67.0%). When stratified by demographic characteristics, we found that African American women and unmarried women were less likely to receive subsequent screening. In addition, as estimated median household income increased, the proportion of women with subsequent screening improved. The percentage of women that received subsequent mammograms within 2 years of the index mammogram was higher for those with an index mammogram between January 1992 and December 1994 compared with women who had an index mammogram between January 1989 and December 1991 (difference = 9.6%; 95% CI, 7.5–11.7%).

Subsequent Screening as a Function of Time. Overall, the median time to subsequent screening was 17.7 months. Fig. 1 illustrates the probability of repeat mammography over time for all women in the study (n = 8749; *i.e.*, those continuously enrolled for at least 2 years). Fig. 1 shows that after excluding those few women with a subsequent mammogram within 9 months, 66.0% of the women received a subsequent mammogram at least 9 months after but within 2 years of the index mammogram. The proportion of women receiving subsequent screening increases steadily up to 36 months, at which time the rate of increase levels off and plateaus at around 88% in 5 years. Fig. 1 also illustrates the effect of timing of the index mammogram, with higher rates of subsequent mammography in the group of women initially screened between 1992 and 1994. The pattern of repeat screening (*i.e.*, the shape of the curve) when the analyses were stratified by demographic characteristics was similar to those seen overall.

Results for Women Continuously Enrolled for at Least 5 Years. When we limited the study population to the 2248 women enrolled continuously in HAP for at least 5 years after the index screening mammogram, we found that 83.3% of women received at least one subsequent mammogram (Table 2). The proportion of women with at least four mammograms was 19.2%, and <1% had at least five mammograms.

Discussion

During the study period, the official guidelines for these HMO members recommended mammography every 1–2 years. However, we conducted an informal survey of 50 primary care physicians serving these members, and we found that the overwhelming majority of doctors (96%) have recommended annual mammography for their patients in this age group since 1990. The target of annual mammography reported by physicians in our health system parallels that of other physician surveys (3–6). Despite the goal of annual screening, in this study we found that among women 50–74 years of age with a normal screening mammogram, 66% received a subsequent mammogram within 2 years of the initial screen, and 88% received a subsequent mammogram within 5 years. The median time to subsequent screening was almost 1.5 years.

In terms of proportions receiving repeat mammography, our results are similar to those from a small study (7) in which 70% of women reported subsequent screening 21–27 months after their first mammogram and from another study in which 73% received repeat mammography within 18 months (8). Other investigators conducted a survey and found that in a community setting, 41% of women had two or more mammograms within 5 years (9). In contrast, one study in a low-income population in Los Angeles (10) found that only 25% of women received subsequent screening within 21 months, and another study in Illinois found that 33% of low-income women received a subsequent mammogram within 3 years (11). However, unlike our study, none of these studies reported the patterns of subsequent mammography as a function of time. Timing was categorized in the Los Angeles study (10); interestingly, the average time to subsequent mammography was 11 months, less than the minimal recommended interval (1, 2). However, these results may be explained by the fact that the investigators did not attempt to exclude mammograms that were performed as follow-ups to abnormal screening results.

We found small differences in the proportion of women receiving subsequent screening for some demographic variables. The proportion of African American women subsequently screened was nearly 5% lower than that for Caucasians, and the proportion for unmarried women was 6% lower than that for married women. Because women in our study were enrolled in a HMO and mammography was a fully covered benefit for these women, barriers related to economic access should theoretically be eliminated in this population. The charge for screening mammography has been implicated as a key reason why women do not undergo screening (12). However, we did find that income, measured indirectly by zip code, had an effect on repeat mammography, with the highest income category showing percentages of subsequent screening almost 10% higher than the lowest category. The effect of income seen in our study is consistent with results from other studies of

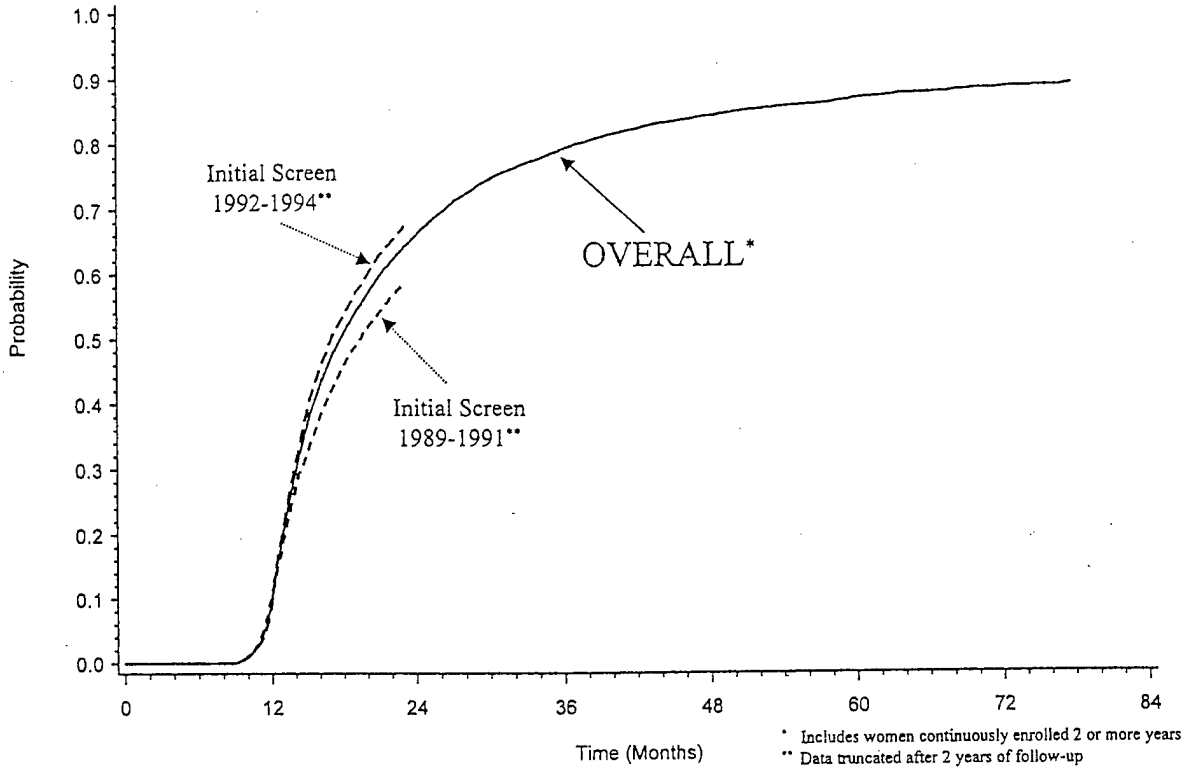

Fig. 1. Probability of repeat screening over time. The probability of repeat screening of women initially screened from 1989–1991 is compared to the probability of repeat screening of women initially screened from 1992–1994. *Solid line*, probability in overall study population.

Table 2 Frequency of subsequent mammograms during 5 years of follow-up, limited to women enrolled continuously for at least 5 years after index mammogram

Cumulative no. of subsequent screening mammograms[a]	No. subsequently screened	% of total (n = 2248)
>5	19	0.8
≥4	432	19.2
≥3	940	41.8
≥2	1419	63.1
≥1	1874	83.3

[a] This category includes only mammograms received at least 9 months after the index mammogram.

repeat (10, 11) or recent (within the past year; Refs. 12 and 13) mammography and even follow-up of abnormal mammograms (14) that show lower rates in low-income populations. The unique contribution of our study is that we were able to examine this effect in a multiethnic population of HMO members. Our results indicate that eliminating other barriers, besides the charge for screening mammograms, plays a role, and health systems need to target low-income women and provide the education necessary to make mammography a habit.

Cross-sectional data from the National Health Interview Survey indicates that the proportion of women who reported receiving mammography within the past year has improved over time (12, 13). In fact, among women 50 years and older, the proportion who had a mammogram in the last year rose from 27.4% in 1987 to 60.6% in 1994 (13). Our prospective results show that the secular trend for recent mammography may also translate to repeat mammography, with an increase of almost 10% comparing 1989–1991 to 1992–1994. We formed these secular categories solely to ensure appropriate and equivalent follow-up data for each time period. However, we can speculate that the improvement over time seen in our system may be due in part to various initiatives within the health system that emphasized the importance of mammography. In 1992, some clinics began measuring and feeding back mammography rates to physicians and emphasizing the importance of a population-based perspective that included outreach strategies for women overdue for screening as well as improvements in office-based strategies to increase screening (15). At this time, some groups began experimenting with developing and implementing new processes for offering mammography (including identification of women due for a mammogram and progress-related feedback) executed completely by nonphysicians (16). Because clinicians and administrators mounted these various efforts at the clinic level rather than the system level, we are not able to directly correlate our findings in this study with any specific initiatives. However, these activities may have prompted physicians and other office staff to focus on encouraging women to receive regular screening.

Whereas a major strength of this study is the setting that removes variation in insurance benefits and provides a relatively standard medical practice, these findings may not be applicable in other populations. In addition, we could only indirectly measure socioeconomic status through the use of zip code information. Another limitation of this study is that we did not have precise data on the indication for all repeat mammograms; instead, we used a time window to separate screening from diagnostic repeat mammograms.

In summary, in a setting in which physicians aimed for annual mammography, we found that certain groups of women were less likely to obtain repeat mammography according to targeted goals. As a result, outreach programs may need to be tailored to improve the adherence among subgroups of women. We also found that in a setting in which physicians aimed for annual screening, the median time to subsequent screening was almost 18 months. This 6-month delay could be viewed as an absolute measure or as a proportion equal to half again the targeted screening interval. Whatever the optimal screening interval is determined to be, recommendations should be made with the understanding of how the timing of repeat screening occurs in clinical practice.

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References

1. United States Preventive Services Task Force. Guide to Clinical Preventive Services: Report of the United States Preventive Services Task Force, Vol. 2, Screening for Breast Cancer, pp.73–87. Baltimore, MD: Williams & Wilkins, 1996.

2. Leitch, A. M., Dodd, G. D., Costanza, M., Linver, U., Pressman, P., McGinnis, L., and Smith, R. A. American Cancer Society guidelines for the early detection of breast cancer: update 1997. CA Cancer J. Clin., *47:* 150–153, 1997.

3. American Cancer Society. 1989 Survey of physicians' attitudes and practices in early cancer detection. CA Cancer J. Clin., *40:* 77–101, 1990.

4. Kripalani, S., Weinberg, A. D., and Cooper, H. P. Screening for breast and prostate cancer: a survey of Texas primary care physicians. Tex. Med., *92:* 59–67, 1996.

5. Stark, M. E., and Crowe, J. P. Breast cancer evaluation and follow-up: a survey of the Ohio Chapter of the American College of Surgeons. Am. Surg., *62:* 458–460, 1996.

6. American Cancer Society. Survey of physicians' attitudes and practices in early cancer detection. CA Cancer J. Clin., *35:* 1–21, 1985.

7. Jepson, C., Barudin, J. L., and Weiner, J. R. Variability in the timing of repeat screening mammography. Prev. Med., *26:* 483–485, 1997.

8. Burns, R. B., Freund, K. M., Ash, A., Shwartz, M., Antab, L., and Hall, R. J. Who gets repeat screening mammography: the role of the physician. J. Gen. Intern. Med., *10:* 520–522, 1995.

9. Taylor, V. M., Taplin, S. H., Urban, N., White, E., and Peacock, S. Repeat mammography use among women ages 50–75. Cancer Epidemiol. Biomark. Prev., *4:* 409–413, 1995.

10. Bastani, R., Kaplan, C. P., Maxwell, A. E., Nisenbaum, R., Pearce, J., and Marcus, A. C. Initial and repeat mammography screening in a low income multi-ethnic population in Los Angeles. Cancer Epidemiol. Biomark. Prev., *4:* 161–167, 1995.

11. Howe, H. L. Repeat mammography among women over 50 years of age. Am. J. Prev. Med., *8:* 182–185, 1998.

12. Breen, N., and Kessler, L. Changes in the use of screening mammography: evidence from the 1987 and 1990 National Health Interview Surveys. Am. J. Public Health, *84:* 62–67, 1994.

13. National Center for Health Statistics. Health, United States, 1996–1997 and Injury Chartbook, p. 201. Washington, DC: United States Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics, 1997.

14. McCarthy, B. D., Ulcickas Yood, M., Janz, N. K., Boohaker, E. A., Ward, R. E., and Johnson, C. C. Evaluation of factors potentially associated with inadequate follow-up of mammographic abnormalities. Cancer (Phila.), *77:* 2070–2076, 1996.

15. McCarthy, B. D., Ulcickas Yood, M., Lee, M. J., and MacWilliam, C. H. Screening mammography use: the importance of a population perspective. Am. J. Prev. Med., *12:* 91–95, 1996.

16. McCarthy, B. D., Ulcickas Yood, M., Bolton, M., Boohaker, E. A., MacWilliam, C. H., and Young, M. J. Redesigning primary care processes to improve the offering of mammography. The use of clinic protocols by nonphysicians. J. Gen. Intern. Med., *12:* 357–363, 1997.